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SHALL WE KEEP THE FAITH?

UNDER the agreement made last January between the British government and the Rubber Club of America, and subscribed to by all the important members of the American trade, the manufacturers agreed, if the embargo on crude rubber were lifted, not to sell rubber either in its crude or manufactured form to any of the enemies of Great Britain or to any neutral country except by way of the United Kingdom. This agreement appears faithfully to have been kept.

But there was a secondary contract, a natural and necessary corollary of the first, which read as follows:

"We will not sell any manufactured or partly manufactured rubber goods to any person in the United States without satisfying ourselves that there is no intention on his part to export or resell the same for exportation to any countries in Europe other than Great Britain, France, Russia or Italy, otherwise than by shipping to the United Kingdom and reshipping from there under license to be obtained for export therefrom."

That this part of the understanding with the British government has been scrupulously observed appears to be open to grave question. The statement is made on authority not open to contradiction that during the six months since the embargo was lifted many ships clearing from New York for Scandinavian and Mediterranean ports have carried motor cars fully equipped with rubber tires. The car makers from whose factories these shipments were made cannot plead ignorance of the agreement as to sales in neutral countries, as all the members of the automobile trade must have been apprised of it repeatedly and emphatically.

It would seem as if some members of the automobile trade took the attitude that the agreement was none of their making and hence none of their concern. If such is the case, there is only one possible course to pursue. If the tire manufacturer finds that he cannot control a certain maker of cars, his supply of tires should be instantly stopped. In view of the guarantees he has signed, the seller of tires can do no less.

There are some in the trade who profess to believe that the English, receiving considerably more rubber than they need, and being more than willing to exchange the surplus for ready cash, would be slow to invoke the embargo again even though considerable quantities of rubber goods found their way to the enemy. It would not take long to explode this fallacy. England may prefer cash which is greatly needed to excess rubber which is not needed, but England's one overwhelming consideration today is the destruction of the enemy, and anything that would in the least postpone that devoutly wished for consummation would get short shrift.

But entirely apart from the question whether the British government if provoked too far would clamp on the embargo again, is this question—Will the American rubber trade, which has entered into an agreement that its product shall not find its way to the enemies of Great Britain, keep the faith?

AERIAL PREPAREDNESS.

MR. ORVILLE WRIGHT, who, by the general consensus of opinion, will be accorded a place on the civilian board of inventors which is to assist the army and navy in our national defence, states that for proper protection in times of peace, not to mention requirements in times of war, our military equipment should include at least 2,000 aeroplanes, which would be very nearly 2,000 more than we have at present.

The utilization of the aeroplane has been one of the most interesting developments of the present war. It is now generally recognized that without these aerial scouts a modern army would be absolutely helpless. It would be like a blind man in a fistic encounter; it would never know where the enemy was going to strike. The aeroplane is the army's eye. It locates the enemy, it perceives whither he is moving and detects his intentions. Because of its far-reaching vision it is no longer possible to strike an army, so protected, unawares.

The introduction of the aeroplane in large numbers in military operations is a matter of genuine importance to the rubber industry, for rubber enters into the construction of this sort of craft in many ways, as was set forth in detail in an article on this subject which appeared in the April issue of this journal. To be sure, if the requirements of the United States army and navy were fully met by the construction of 2,000 of these flying machines, the demand on the rubber industry would hardly be noticeable. But in view of another statement made by Mr. Wright, namely, that the average life of an aeroplane in active service is only seven hours, it will be seen that the construction of the initial number of necessary flyers is only the beginning, and that once engaged in active operations, they would require continuous replacing. This would mean aeroplane construction on a scale that would certainly open up a considerable field for the further consumption of rubber.

ONE REASON WE IMPORT GERMAN RUBBER GOODS.

THE rubber manufacturers of the United States produce a much larger yearly output than those of any other country. In fact they equal the product of all foreign manufacturers combined. It is natural to assume, operating on this great scale, that their factory equipment must be superior to that of plants in other parts of the world, but, to keep well within the bounds of moderation, it is certainly safe to say that American rubber factory equipment is quite as good as that to be found anywhere.

If this mechanical equality—not to claim any superiority—were not sufficient to insure a home market for American manufactures, there is a duty on the imports of rubber goods ranging from 10 to 35 per cent. And yet, in the face of this, Germany manages, or did up to the outbreak of the war, to market a considerable quantity of rubber goods in this country. The question, therefore, naturally arises how it is, in view of our manufacturing capacity and the double handicap of the expense of transportation and the payment of duties, that Germany can compete in the American market. The answer will be found in some tabulations that appear on another page in this issue, taken from a report recently issued by the German Factory Workers Union, which in 1913 made a thorough investigation of the conditions under which German rubber workers are employed. This tabulation shows in great detail the wages earned in the different departments of the German rubber factories.

The investigation covered 86 plants and a general average was made of the lowest wages and also of the highest wages paid for each sort of work. Omitting all mention of the lowest wages, we find that the average highest wages for a week consisting of 55½ hours in these German rubber plants run as follows: For washers, $5.64 a week; for mixers, $6.58; for makers of inner tubes, $5.66; for footwear makers, $6.07. The comb polishers seem to fare the worst, the average maximum wages for this work being $4.86, while makers of hard rubber insulation receive $8.33; the general average of the best paid skilled workmen in these factories being about $6.50. In the German mills the women practically do every sort of work that is done by the men—they are employed as mixers, in the making of hose, inner tubes, casings and insulated goods and also in the preparation of crude materials. But citing only the one class of work which is quite universally done by women in this country—the making of light rubber footwear—we find in the German mills the best paid women shoemakers get $3.33 a week; which is about the average wages for women in the various manufacturing departments.

Comparing American wages for the sort of work referred to above, we find that washers get $14 a week; mixers, about $18 a week; boot makers and tire makers engaged on piece work, from $18 to $30, or, say, an average of $22 a week; while the women shoemakers get from $10 to $12 a week.

If we were to make parallel columns of these wage scales, we should find that the workers in American rubber mills get about three and a half times the wages paid for the same class of work in Germany. It is not particularly difficult to see, therefore, how it is that, notwithstanding the double disadvantage of transportation costs and imposts, Germany has been able to sell some of her rubber manufactures in the American market.

WILL THERE BE ANY RUBBER MEN?

SECRETARY DANIELS has applied to the officers of eight scientific societies asking each of them to select two representatives for membership in the Bureau of Invention which is to co-operate with his department. The societies appealed to comprise organizations of electrical, mining, civil and mechanical engineers, chemists, aeronauts, inventors and a mathematical society. All of these men of science, including the miners and the mathematicians, will undoubtedly be helpful in devising ways to do up the enemy; but where are the rubber men?

The really clever work in naval operations during the present European trouble has been done by the submarines, and the only device for keeping an eye on the submarine is the flying machine, and neither one of these would be worth its salt without rubber. Without rubber the submarine would be so full of leaks that it would go to the bottom like a stone, and without rubber the aviator, though he might succeed in getting up, would certainly be afraid of coming down.

But Secretary Daniels is only feeling his way. By the time his advisory board is completed it will doubtless include a couple of rubber representatives to see that the ideas of the others will hold water.

A FAMOUS CHANCE FOR A RUBBER DETECTIVE.

BRAZIL is making an earnest and anxious search for someone who knows which is which in rubber. When he is found he will be assured a warm welcome and doubtless substantial remuneration. As is known to every student of South American affairs, the Brazilian government has sought for a number of years to devise measures to protect the rubber of the Amazon from the ever-increasing encroachments of plantation rubber, which, it will be remembered, had its origin in the seeds surreptitiously abstracted by the impious Mr. Wickham.

In furtherance of its campaign for encouraging the use of Amazon rubber, the federal legislature of Brazil formulated last year certain new tariff regulations for 1915 which, as far as home consumption was concerned, would place articles manufactured from Eastern rubber at a great disadvantage as compared with articles made from rubber exported from Manaos and Para. For instance, pneumatic tires and inner tubes for automobiles and other vehicles, if made from Brazilian fine Para, were to be admitted, under this new schedule, with an ad valorem duty of only 5 per cent., but if made of any other rubber the duty was to be ten times as much, or 50 per cent.; while in the case of solid tires and various other articles manufactured from rubber, those made from Brazilian fine Para were to pay only 100 reis per kilo., while those made from rubber of foreign origin were to pay one hundred times as much, or 10 milreis per kilo.

Here was a differential tariff which would seem to provide adequate protection for the rubber gathered in the Amazonian forests. But when the new tariff went into effect a great difficulty was immediately encountered. No one connected with the Brazilian customs seemed able by any of the five senses customarily accredited to man to detect whether the hot water bottle, tire or raincoat under consideration contained the smoked latex from the Amazon jungles or the smoked latex from the Eastern plantations; nor were the laboratory facilities of Para equal to the work of discovering which was which. Consequently the new tariff was held in abeyance, while representatives of the government went forth into the scientific centers of the world to find someone who could sit at the Brazilian seat of customs and tell unerringly where the rubber came from that entered into the article offered for import.

If, as is quite probable, this problem is too much for the chemists, will not the clairvoyants kindly come forward?

THE TIRE ADJUSTER DOOMED?

A MOST interesting and necessary personality is the Tire Adjuster. Polite, persuasive, alert, he soothes the ruffled, praises the fair-minded and blandly rebukes the prevaricator. He saves money for his company and makes friends of complainers. That so picturesque an individual should have his profession threatened with extinction is a pity. Yet that possibility is in sight. One of the great tire concerns is possessed of a detector which, if it proves practical, will supersede all expert estimating of mileage. It is a simple little appliance, buried in the bead, that unerringly takes the count for every rotation of the tire. The idea is novel; indeed is excellent. It is also suggestive of wider application. Why not adapt it to footwear? Why not conceal it, for example, in rubber boots, and put an end to false claims as to wear? Would it not be of value in rubber belts, secretly registering the day's work? Analagous to it would be a tiny instrument to record the amount of water passed through each length of fire hose; a self-registering thermometer in hot water bottles proving the use of boiling water, and so on.

Whether or not such mechanisms come into use and displace tire and other adjusters, certain it is that guess work in rubber is swiftly becoming a thing of the past.

IN THE PASSING OF THE HON. WILLIAM M. IVINS, THE rubber trade loses one who in years past was one of its most brilliant and forceful figures. His connection with William R. Grace, his association with the founders of the United States Rubber Co., his presidency of the General Rubber Co., and his active interest in the trade during its formative period, make him one of the founders of the industry. He knew the markets of Europe and of South America better than most, and his vacation trips were to the tropical rubber centers rather than over the beaten tracks of the tourists. A brilliant and convincing speaker, a fascinating conversationalist, the possessor of a great store of knowledge, the trade and the country lose a unique and commanding personality.

The Story of Gutta Percha.

EARLY HISTORY.

IT is to the Dutch that we owe the first as well as the last word in the history of gutta percha. The last word is the history of the firm establishment in Java of the scientific cultivation and utilization of the plant. The first was when the Dutchman, John Tradescant, brought to England the first specimen of gutta percha which attracted the intelligent curiosity of white men. The Tradescants, father and son, the former sometime gardener to Charles I of England, were botanists and travelers, alert and wide-awake men, greatly in advance of the age in which they lived. They established a museum of "rarities" at South Lambeth, "neer London," a heterogeneous collection of curious objects from many lands. In the catalogue of this "Museum Tradescantium" there occurs an entry which for two hundred years attracted little attention but which now holds a surpassing interest for all students of the industrial side of the history of civilization. This notes that "The plyable mazer wood, being warmed, will work in any shape." That is all. No attention was paid to it and, in spite of statements to the contrary, the specimen was lost and is no longer to be found among the remains of the "Museum Tradescantium," now housed at Oxford.

JOHN TRADESCANT, SR.

But though nothing further came from the bringing to Europe of this earliest known specimen of gutta percha, the history of that necessity of civilization cannot be written without reference to the Tradescants. They knew that the strange pliable wood was worth attention. But that was an age of politics and religion, and people had no taste for such minor matters as science and invention. Modern encyclopedias and biographical dictionaries slight the Tradescants, who, however, have been immortalized by having had named for them the genus *Tradescantia*, by an authority no less than the great Linnaeus himself.

The fact that it was called wood is not strange, for gutta percha in its crude form shows a distinct fibrous appearance. The wood "Mazer" comes from an old Teutonic name for the maple and was given to drinking cups originally made from the wood of that tree. They were shaped like the classic "crater," a flaring cup with a foot, thereby distinguished from the "tumblers," which would not stand on the table, thus placing upon the guest the necessity of drinking all the wine poured out by the hospitable host.

From 1656—in the time of Cromwell—one hundred and fifty-six years passed before the strange substance again attracted the attention of civilized men. Then Dr. William Montgomerie, British medical resident at the newly founded town of Singapore, observed whips of a strange material in the hands of some of the natives. They told him that it was "gutta percha." Any person who has had experience in getting information from "natives" anywhere can imagine the Scotch physician's questions and the answers he received. What was gutta percha? Why, it was just gutta percha, that was all. What was it made of? What a question! The whips were made of gutta percha, but gutta percha was gutta percha and that was all there was to it. Where did they get it? Why, they bought it of a man who had gutta percha to sell. Where did that man get it? Why he bought it of another man. That was the only way gutta percha was to be had—to buy it of somebody who had it to sell. It was all very simple and only a muddle-headed white man could ask such foolish questions as to what it was, when anybody could plainly see that it was gutta percha; and ask where it came from, when it could be had of any trader who kept it for sale.

After twenty years, however, Dr. Montgomerie had found that it was made from the coagulated milky juice of a tree and was able to obtain several specimens of the material. On the first of March, 1843, he wrote from Singapore to the Medical Board at Calcutta, describing the physical properties of the substance and suggesting its use in the manufacture of certain surgical instruments. With this letter he sent some instruments he had manufactured with his own hands, also the handle of a parang, the East-Indian congener of the Spanish American machete, and used by the natives for all manner of purposes, from cutting down trees to slicing disagreeable neighbors. He was unable to obtain any parts of the plant to aid in its botanical identification. The reason is interesting. The locality where the trees were found, seven miles from Singapore, was so infested with tigers that nobody cared for the task of collecting the desired specimens. Dr. Montgomerie's letter was printed in the "Journal of the Agricultural and Horticultural Society of India" and is the first published article which clearly and definitely gave to the world a knowledge of gutta percha.

It is an unfortunate fact that through the whole history of the world there has been scarcely an important invention, discovery or epoch-making fact of any sort which has not been the occasion for controversy of a peculiarly bitter kind. The introduction of gutta percha to the arts of civilization is not an exception and the question of priority cannot be shirked. In the spring of 1843 Dr. Jose D'Almeida, a British subject in spite of his Spanish name, brought to England a riding whip made of gutta percha and also a piece of the crude material. These were presented to the Royal Asiatic Society, the secretary of which acknowledged their receipt in a letter dated April 8, 1843. In the summer of the same year Mr. Henry Gouger, on behalf of his brother-in-law, Dr. Montgomerie, presented to the Society of Arts a bottle of the latex of the gutta percha tree, together with specimens of the gum in various early stages of manufacture. The specimens received by the Royal Asiatic Society from Dr. D'Almeida attracted no attention. That sent by Dr. Montgomerie to the Society of Arts was referred to a committee which, at a later date, January 23, 1845, reported that "this substance appears to be a very valuable article and might be employed with advantage in many of the arts and manufactures of the country."

Further experiments made under the auspices of the So-

ciety of Arts, including the making of belting and water-pipe, confirmed this opinion; and on June 2, 1845, the society justly awarded to Dr. Montgomerie a gold medal for his discovery and suggestion as to the uses of gutta percha. It is here that controversy begins. The society which received and gave to the world the knowledge of gutta percha has been criticized for awarding the honor to the man who furnished it with the information and material, instead of to another man who sent the substance merely as a curiosity to another society, which received it in the spirit in which it was sent. So far as is known, Dr. Montgomerie was the first white man who made use of gutta percha as a material for manufacture; the first to suggest to others its use; the first to give to the world a published account of its origin and its actual and possible utility; the one who indisputably brought it to the attention of the men who first engaged in the commercial production of its manufactures. Had Dr. D'Almeida sent his specimens to the Society of Arts and Dr. Montgomerie his to the Royal Asiatic Society, the medal might have been differently awarded, but the fact would have remained that Dr. Montgomerie was still the first to utilize and publish the discovery. In any event, however, the seed sown by Dr. D'Almeida fell on absolutely sterile soil while that of Dr. Montgomerie took root and grew. The man who bets on the wrong horse is entitled to sympathy, but not to the stakes. And aside from the fact that the specimens of Dr. D'Almeida were exactly in a class with those of the Tradescants, unquestionable priority must be awarded to Dr. Montgomerie and all according honor for having introduced gutta percha to the world of science and the useful arts.

JOHN TRADESCANT, JR.

The etymology of gutta percha is obscure and probably will remain so to the end of time. That it is from the Malay language is undoubted, also that "gutta" means the gummy exudation from any tree. But here the trouble begins. Nobody has agreed as to what "percha" means. Every explanation which has been hopefully brought forward has fallen to the ground when examined by men with a thorough knowledge of the Malay language. As to "gutta taban" and "taban meerah," it appears that "taban" does not mean simply "tree," but a gutta-percha producing tree. In Sumatra the equivalent term is "balam," while in the Philippines it is "nato." "Meerah," it is on all hands agreed, means "red," so that "gutta taban meerah" is "gutta" from the red "taban." According to Mr. Curtis, sometime superintendent of the Penang Botanic Gardens, the natives give the name "taban percha" to *Palaquium maingazi*, a tree similar in appearance to *Palaquium gutta*, but furnishing a quite worthless gum. This might indicate that the Malay informants of Dr. Montgomerie were themselves misled. One native may have pointed out a tree and said that this was the tree which furnished the handle of his parang. Another, knowing or believing that this was a "percha" tree, may have declared that the substance was "gutta percha." But whatever the mistakes or the accuracy of these little brown brothers of seventy years ago, the name gutta percha will endure as long as the world stands. Our language is full of names once misnomers, but they have a meaning now and are not going to be changed. In regard to the spelling "gettah," occasionally affected, it need only be pointed out that spelling the words of barbarous people is always a difficult matter. Elisions are common and their vowel pronunciations are varied and obscure, more often than otherwise merely a neutral sound which might represent the short form of any of the five vowels. The same is true of uneducated or careless speakers in every country. In the case of the Malays and others using the Arabic alphabet, which represents only consonant sounds, the possession of a written language does not help to fix the speech, so far as vowel sounds are concerned.

The "taban meerah" or red taban, *Palaquium gutta*, gets its name almost certainly from the color of the bark, a warm, red brown which is constantly maintained by the outer bark falling away in small chips. The under side of the leaves, the only side seen by a person walking under the tree, has a golden or coppery red sheen. The young twigs and even the fruit are covered with reddish brown hairs. The inner bark is decidedly red, the wood is reddish brown and the gutta is reddish. No wonder the natives called it taban "meerah." The flowers are in sixes—six sepals, six divisions of the corolla, twelve stamens in two series of six, and six pistils. Of these, all the seeds but one or two are abortive, the result being a drupe-like fruit as big as a good-sized plum and with a sweet and eatable pulp which, however, according to Mr. Wray, "has a disagreeable flavor of gutta percha." This flavor does not bother the native fruit-bats, which are very fond of the fruit. These bats are very pugnacious and egoistic individuals and one of them cannot bear to see another eating the fruit he would like to eat himself. So, when one has secured a fruit and does not wish his coat punctured by one of his brothers, he detaches it from the tree and flies to another tree of a different species standing anywhere from a few yards to a quarter of a mile away. There he eats the pulp and discards the seeds which are too large and hard for his purposes. It is this process which has scattered the trees throughout the forests of the districts to which they are native. The seeds are as large as almond kernels and contain a valuable oil which is solid up to a temperature of 90 degrees Fahr., and is used by the natives for culinary purposes. Of course the seeds of the best species are far more valuable for planting than for butter purposes just now, but when, in the distant but certain future, the supply of plantation gutta percha approximates the commercial demands, the oil from the seeds is likely to prove a valuable by-product.

Of course it is its peculiar and wonderful product which gives the tree its interest above all others of its family. Fruits, oils, timbers, are all needed in our economy, but without gutta percha there would have been no submarine cables and many an important scientific experiment never would have been made. While everybody knows that gutta percha comes from the "juice," there are still too many who think that it is the sap of a tree. Just how a thick and viscous fluid could perform the functions of a sap has certainly never occurred to them. Of course, the exudation from which gutta percha is derived is a latex or milk, which is not, as often said, the English translation of the Latin-derived name, meaning simply juice. Though it is true that the latex of most plants is white like milk, a few have yellow or even red latex. It is said that in all cases it is colorless while in the latex cells,

but becomes turbid on the instant it is exposed to the air. It is found in many species and families of plants, the poppy, milkweed and spurge families, with the strap-flowered section of the Compositæ, being well-known examples.

COMMERCIAL BEGINNINGS.

A short time before the award of the gold medal to Dr. Montgomerie, Mr. H. W. Jewesbury, who learned of the investigations of the new substance, determined to send an order to Singapore for a quantity of gutta percha. Before this order was sent he chanced upon a cask containing forty-five lumps of gutta percha, weighing about two hundred pounds. It had been sent on speculation and had lain at the docks for many months without a purchaser. It was bought for ten pence (twenty cents) a pound, this being the first commercial transaction in gutta percha in civilized lands. This was on the 30th day of April, 1845. In May of the same year the predetermined order for five hundred pounds was sent to Singapore. By the next mail went an order for ten thousand pounds and next month an order for a hundred thousand pounds. Gutta percha, in the slang of a few years past, had caught on and was soon scrambling toward a front seat in the car of commercial progress. At first the experimenters seemed, like the Tradescants, to regard it simply as a "plyable wood" which, being heated, could be molded into any shape. Then came the wild determination that it should take the place of india rubber, whether it would or no. It was made into clothing, cups, canes, plates, boxes and a thousand other things which could as well have been made of some other and less expensive material. Some other early uses, for which it was well adapted, were manufactures of water-pipes, acid tanks and surgical articles.

DR. WILLIAM MONTGOMERIE.

Gutta percha had certain resemblances, both real and illusory, to caoutchouc and it was, at the time, very much cheaper. So whatever could be done with rubber was undertaken with gutta percha. This was attempted the more desperately because the Goodyear patents shut out all but holders under their right from the use of india rubber in its only practicable, that is, its vulcanized form. Therefore they insisted that if gutta percha were not elastic and durable in air and sunlight it ought to be and must be. They needed the money. So they went ahead with their vulcanized and unvulcanized gutta percha, making articles of commerce if not of utility, and left behind them a collection of advertisements which make curious reading sixty years later. One American firm made a considerable success and produced goods of excellent quality, using several closely kept factory secrets—the greatest of which was that the material used was not gutta percha, but rubber.

But it was at about this time that the stone which the builders rejected became the corner of the temple. The dawn of the age of electricity was at hand and gutta percha was indispensable for its most important development—that by which the ocean-sundered continents were brought within hailing distance of each other.

The question of who first discovered the electrical qualities of gutta percha is one of interest, but one which has not been answered quite to the satisfaction of all inquirers. Professor James Collins, who has given a vast amount of time to the history of gutta percha and who is not influenced by family or associations in consideration of the problem, says flatly (Encyclopedia Britannica) that the electrical qualities of gutta percha were first noticed by Faraday. It has been pointed out that others were undoubtedly in possession of the knowledge before Faraday's publication of the fact in 1848, but it has not been shown that any one else published the discovery before that date or that anyone knew the properties earlier than did Faraday. The claim that anybody anticipated the discoverer of induction and diamagnetism in gaining an understanding of the properties of a substance which had attracted the lively scientific interest of all the world at that time, is one that calls for a weighing of probabilities and a production of proofs. Of course the name of Faraday stands like a mountain peak in the field of electric discovery and the taking away of a single stone would not alter its place above the skyline of history. As to who first made the discovery under discussion, is not so much a question of justice to Faraday as of justice to gutta percha.

The question is less important in view of the fact that the discovery was inevitable and the application within a very short time. The first to make practical application of gutta percha for the insulation of cables was Werner Siemens, a Prussian infantry officer, who was later known as von Siemens, having, after the German fashion, been made "high and well born" for his successes in the field we are considering. He was a brother of Sir William Siemens, a naturalized British subject, an eminent scientist and inventor and a close friend of Faraday. It was from Sir William that Werner von Siemens received a sample of the original lot of gutta percha sent by Montgomerie to the Society of Arts.

In 1847 von Siemens began the manufacture of what was probably the first gutta percha-covered subterranean cable and also invented a machine for covering wire with that substance. At that time there were more than fourteen hundred miles of underground cable in Germany, insulated with other materials. But the insulation was in every case either defective or subject to quick deterioration and the use of gutta percha was of far-reaching importance.

The submarine cable had another and separate origin. As the first land-telegraph line was American, so was the first gutta percha covered subaqueous line. This was made about the middle of September, 1847, by Dr. John J. Craven, of Newark, New Jersey, who, with the assistance of his wife, covered with gutta percha a piece of wire about fifteen feet long and sunk it beneath the waters of Bound Creek, a narrow salt-water inlet crossing the present roadway of the Pennsylvania Railroad between Newark and Elizabeth, New Jersey. The ends of this little pioneer submarine were then connected with the land telegraph line between New York and Philadelphia, and messages were flashed under the briny waters of Bound Creek which, if not as deep, were quite as wet as those of the Atlantic Ocean. This test led directly to the laying of a cable, under the Passaic River at Newark by the Magneto Telegraph Co. This also was made by Dr. Craven. It likewise proving a success, a more important venture followed, the same company laying a cable, June 15, 1848, across the North River, landing at Cortlandt street. This cable, a mile long, settled the question of the commercial practicability

of submarine cables and only the problems connected with the great lengths of the ocean cables and the vast depths they must be laid remained for solution.

In the meantime, in Europe, gutta percha was falling into disrepute as an insulating material and it remained for the Americans to show that the useful gum had been sinned against rather than sinning. It is a curious illustration of the empirical methods in vogue at that time—the utterly irrational manner in which these cables were made by men who were at the same time wise enough to make them at all. They knew that india rubber had been "vulcanized" by heating it with sulphur, thus rendering it immensely more valuable. They knew, possibly, that "brimstone and treacle" was part of the *materia medica* of Dotheboy's Hall. At any rate, with this or other information at hand they looked at the defenseless gutta percha in their possession and decided that its constitution would be improved by a dose of sulphur. So they remorselessly went ahead with their brimstone treatment, feeling certain that if gutta percha were excellent, surely vulcanized gutta percha would be super-excellent. But the result was not just as expected. The electric current promptly set up a chemical union between the sulphur of the sheath and the copper of the wire, turning both wire and insulator into sulphate of copper, a substance which, however excellent for spraying cucumbers, is not well adapted for the transmission of electricity. The cables turned into a pale blue streak and the misguided vulcanizers recorded their opinion of gutta percha in speeches which might have answered the same description.

GATHERING GUTTA PERCHA.
[From an Old Print.]

The North River cable was made by Stephen Armstrong, of Brooklyn, and consisted of a No. 9—some say No. 12—iron wire, enclosed in one-half inch of gutta percha insulation. Mr. Armstrong was not only the first cable-maker but the first importer and manufacturer, in America, of gutta percha on a commercial scale. He seems to have been one of the first, if not the very first, of the manufacturers to question the necessity or advisability of administering big medicine to a patient as healthy as pure gutta percha. He showed Vulcan the front door of his Brooklyn factory, but the lame god lingered for many years in the establishments of many manufacturers, particularly on the continent of Europe, freely distributing the yellow gift of Aetna or Popocatapetl and spoiling everything he could, until the expiry of the Goodyear patents placed rubber at his disposal and gave him useful work to do. Mr. Armstrong, seeing the vast possibilities of gutta percha insulation, proposed, in 1848, in the New York "Journal of Commerce," that an ocean cable be laid between Europe and America.

In 1851 the first important submarine cable was successfully laid between Dover, England, and Calais, France. This was accomplished by the Brett Brothers, who, in 1846, had applied to the French government for a concession to lay such a line. On August 28, 1850, a single gutta percha-covered wire, like that of Dr. Craven, was laid just in time to save their concession. The slight insulation led the makers to expect almost immediate failure but, meantime, messages had been exchanged and time was permitted for repairs. It was afterward learned that the expected early failure was accelerated by some French fishermen who gappled and brought up the wire and, wondering what it could be, cut out a liberal section to carry back to France as a souvenir. The second cable was opened to general business November 13, 1851, and continued in service for many years. This was the prototype of all later submarine cables having a core of copper wires, insulated with gutta percha, surrounded by tarred hemp and protected by spirally wound galvanized iron wires. It is a curious illustration of the survival of early errors that nineteen out of every twenty persons know what a cross section of the ocean cable looks like and eighteen of the nineteen think that a separate message passes over each of the protecting wires. Two years after this first cable Ireland was successfully annexed to Europe by submarine cable and a new line was laid from Ramsgate, England, to Ostend, Belgium. This also was laid by the Bretts. It not only gave the British Isles connection with the continent of Europe, but had that connection free from control by Napoleon the Little, who had recently made himself Emperor of the French. After this, rapid progress was made in connecting the islands of Europe and making short cuts across waters which before had been expensively skirted by land lines. But America was still shut off from the rest of the civilized world.

The question of who first thought of a transatlantic cable is one which will not be answered. The idea is one which would occur to every intelligent mind as soon as the electric telegraph had proved a success. And, as always happens, the first suggestions were scoffed at as the talk of idle dreamers by the "hard headed" business men and scientists, whose boasted hardness of head is often much of the quality of cast iron. But, as is also always the case, the dreamers went on dreaming until their dreams were translated into reality. One of the earliest of these dreamers and the first to make efforts leading to practical results was Cyrus W. Field, a member of the very remarkable family of brothers, which included David Dudley Field, who has been called one of the three code-makers of the world, the other two being Justinian and Napoleon. In 1854 Mr. Field secured a charter for a company, with the purpose of laying a cable between the two continents, via Ireland and Newfoundland. Among the names of those associated with the enterprise were those of Marshall O. Roberts, Peter Cooper, David Dudley Field and Professor F. B. Morse. Among the English subscribers, one of the earliest and largest was John W. Brett, the pioneer of ocean telegraphy. In England the chief promoter was Sir Charles Bright, who was knighted for his services.

Mr. Field bore up amid every discouragement and made fifty trips across the Atlantic before winning final success. In 1857 the cable ship started, but the cable broke and was lost. Next year one was successfully landed, and on August 16, 1858, cable messages of congratulation were exchanged between Queen Victoria and President Buchanan. This line worked for a few weeks and then became useless. Finally, on July 27, 1866, permanent connection was made between the two continents.

India Rubber in the Making of Explosives.

THE whole art of modern war is the science of explosives. Not only is all Europe engaged in the manufacture of explosive material, but the powder plants in the United States are working night and day to supply these essentials to the belligerents. There is no explosive that is made from rubber,

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WRINGER IN THE NITRATING HOUSE.

but it is safe to say that without the assistance of rubber no explosive could be manufactured.

Somewhere on the Atlantic coast, back in 1898—the censor might object if we mentioned the port—the military authorities decided to mine the harbor approaches lest the Spanish cruisers dash in and lay the city under tribute. Accordingly, the soldiers of the regular army at the post were set busy charging the submarine mines with dynamite. It was not very long before these men were too sick to discharge their duties, and the preparation of the underwater defense of that port came to a standstill. Now the trouble was that the dynamite—which is made up of an infusorial earth saturated with nitroglycerine—was old and had begun to exude its explosive content. It was hot weather, the work was toilsome, and the men perspired freely, and they also labored with bare hands. Nitroglycerine is both a poison and a powerful tonic. As the soldiers worked they wiped their reeking brows and faces with their hands, and thus into their systems entered the stimulating and then the toxic exudation from the explosive. It was not until some volunteers, forming part of a hastily organized body of military engineers, were assigned to the planting of the mines that the cause of the trouble was disclosed. These men were familiar with dynamite through blasting operations. When they tackled the job—and they did so quickly and understandingly—every one of them put on rubber gloves, and there was no more trouble.

If you could look inside a plant where nitroglycerine and dynamite are made you would see how careful the operatives are to wear rubber gloves, reaching well to the elbow, and also rubber boots, in order that the toxic explosive glycerine shall not work its way into the body through the hands and feet. There are thousands of men now engaged in the preparation of these military agents, and rubber is indispensable as a physical safeguard. The same need applies in the manufacture of smokeless powder; and as this department of ordnance supplies is probably one of the most interesting, we shall describe how this most modern of propellents is made at the naval powder factory at Indian Head, Maryland. We purposely choose this establishment because it typifies the highest state of the art and is intimately identified with the nation's foremost line of defense.

The base of our smokeless powder is cotton waste. The cotton filament is really a tiny tubular structure composed of an indestructible substance called cellulose, which, when sufficiently saturated with nitric acid, undergoes a chemical metamorphosis; in short, it then becomes an explosive, and is technically called nitrocellulose or guncotton. Nitrogen has the notable property of carrying a very large measure of oxygen as well as possessing inherent molecular energy of a pronounced order. The oxygen makes for more perfect combustion, hence contributes to smokelessness, while the resultant heat and energy of inflammation give us the desired properties to be found in the high explosives now employed both in military and industrial work of a variety of sorts.

Down at Indian Head, the cotton waste is run through a stripping machine that combs it out; and then it is washed to remove all traces of grease. For this purpose, the cotton is cleansed in an alkaline bath, and here we see the workmen busy at their task in rubber boots. With this operation finished, the cotton is then subjected to a drying process and is stored in chambers heated to a temperature of 212 degrees, Fahrenheit.

In the drying rooms, after a sufficient exposure, the cotton is packed in metal cylinders made airtight by having their covers seat down upon gaskets of rubber. This is to prevent the stuff from reabsorbing moisture from the free atmosphere. Packed in this fashion, the cotton is ready to be carried to the nitrating house, where it is transformed from a harmless material into a high explosive. The primary purpose of the drying is to stimulate the absorption of the metamorphosing acid, and it is during this permeating process that we realize that the cotton has not been freed of all of its moisture by its previous heating.

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MECHANICAL KNEADER BY WHICH ETHER-ALCOHOL SOLVENT IS WORKED INTO GUNCOTTON.

The effect of the nitric acid is to liberate the stubborn moisture,

and this produces enough water in the course of a short while to dilute the nitric acid. The thing desired is to have the acid in its full strength attack the cellulose and thereby intensify the vigor of the explosive so formed. A weakened nitration would be a drawback. The clever chemist has overcome the difficulty in this way: sulphuric acid is mixed with the nitric acid because sulphuric acid has a strong affinity for water. What follows? Why, the sulphuric acid takes up the increasing moisture and this

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NITRATED COTTON BEING DUMPED INTO STEAMING VATS.

leaves the nitric acid unimpaired and capable of doing its full work upon the cotton.

The nitrating house at Indian Head looks inside not unlike a section of a big steam laundry, and, indeed, kindred facilities are actually employed there. The cotton in being nitrated is put in centrifugal wringers much like those in which clothes are washed wholesale. When the nitration has reached the proper point, and the artisan knows this, the cotton is roughly freed of the bulk of the acid by the mechanical wringer. The men at the machines are apparently indifferent to the intensely acrid atmosphere which bites the unaccustomed throat and nasal passages. But just the same, these workers have to be very careful, and here is where rubber protects them. In addition to long rubber gloves and rubber boots they wear aprons of the same sort which cover the front of the body, the hips and the legs well down below the tops of the boots.

When the cotton has soaked long enough in the acid it shows signs of incipient combustion by giving off a dense brownish smoke. At once the material is dumped into vats, where water is turned upon it by means of rubber hose. After being properly "drowned" the cotton is taken out and partly freed of its liquid content by means of other mechanical wringers. The stuff is now guncotton or pyro-cellulose. What follows is something in the nature of a paradox. Just as determined as the experts were to thoroughly saturate the cotton with nitric acid up to this stage, they are now bent upon removing every trace of the transforming chemical. Indeed, the stability of the explosive subsequently and its value as a propellent depend upon the thoroughness with which the succeeding operations are carried out.

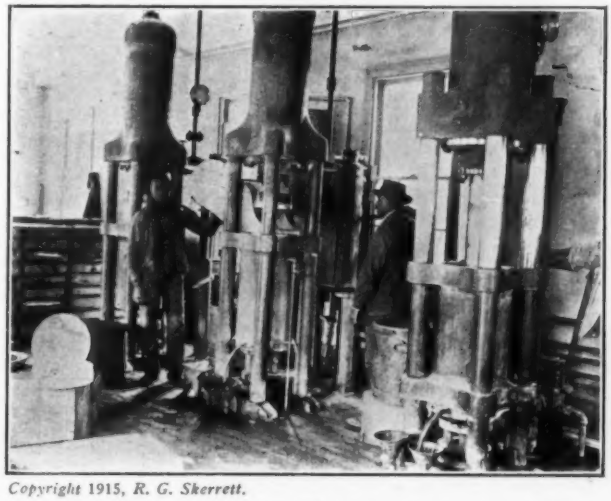
The "pyro"—to adopt the abridged term used at the factory—is carried from the nitrating house in open tubs placed upon flat cars, and transported to great steaming vats. Into these it is dumped, and for the better part of 48 hours it is boiled continuously, for the purpose of extracting the biggest part of the free acid still clinging to the cotton filaments. After two days of boiling, the "pyro" is removed from the vats and carried to the pulping house.

In the pulping house the "pyro" is pulped and poached just as are the materials used in paper making; and after anywhere from 20 to 30 hours of this pulping—the time depending upon the acid index of the liquid—it is finally freed of the last trace of the transforming chemical. Strange as it may seen, the boiling and pulping processes do not vitiate the work of the initial nitration. The chemical change worked in the cotton is a permanent one, and the subsequent operations are intended to remove only the unabsorbed acid. The pulping house is a wet place, and here, too, the workers wear rubber boots and rubber aprons, and, occasionally, rubber gloves. Of course rubber hose is used extensively.

Immediately after coming out of the pulping vats or tanks, the problem is to get rid of as much of the water as possible. The slimy material is carried upon a belt of blanketing to a "wet machine," and from the rollers of this apparatus it issues in flakes containing in the neighborhood of 40 per cent. of moisture. This must be got rid of, and to that end the pulped "pyro" journeys to what is known as the dehydrating house. There all but a very limited percentage of moisture is removed by means of successive applications of pressure. But this does not suffice. The last trace of dampness is driven out of the "pyro" by a topping or bath of alcohol.

Again, the powder maker has borrowed from domestic life, for the next machine is a mechanical kneader like those to be found in large steam bakeries. Into this kneader the "pyro," with its percentage of alcohol, is dropped in the form of big white discs. There the right proportion of ether is added, and the mass is worked for 30 minutes. At the end of that time the product is not unlike damp cracker crumbs, and feels much like them. The object of the kneading is to thoroughly mix in the solvent of ether and alcohol. The material has undergone another change by this process, and indeed is chemically smokeless powder. But there are yet a number of things to be done before it is fit to be issued to the naval service and safe for firing in the guns afloat.

Various applications of pressure now follow, and this gives



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PRESSES USED FOR DRIVING OUT WATER AND FORCING IN ALCOHOL.

the "colloid," for such it technically is, its required homogeneity. First, it is pressed into cylindrical cakes weighing about 50 pounds each, and to the inexpert the substance might be mistaken for crude rubber. It has a certain measure of elasticity when dropped, and will rebound. Into the press again the cakes go, coming out through sturdy steel colanders in the

form of writhing cords like soaked macaroni. These cords are put back into the press and sqeezed into a single compact cake for the sake of more perfect union, and then the plastic mass is ready for the powder press.

The form of the grains or powder units is one of the technical niceties of the art, because this regulates the speed with which the grains will burn, and the uniformity with which they will generate their propulsive gases. Depending upon the size of the grain to be made, the "colloid" is subjected to pressure ranging from 4,000 to 6,000 pounds to the square inch, and under the thrust of the powerful piston the stuff is forced through a die that causes it to issue from the press in the shape of an endless stick of pale yellow—twisting and moving like a snake. Instead of having one hole, however, through its center, it has that and a concentric group of others perforating the rod from end to end. Every time the rod reaches the end of the table one of the men cuts it off at the press outlet, and then the length is laid alongside its predecessors and straightened. These are next fed to a cutter, which divides the rods into the so-called grains of uniform length. The number of perforations in the rods and the size of the grains are dependent upon the caliber of the gun and the length of the weapon in which they are to be fired. Here are details that should be explained.

If the powder grains were solid it is clear that their outer surfaces would diminish as they burned and, accordingly, less and less gas would be generated. Now the desire is really to maintain a reasonably uniform propulsive impulse up to a certain point in the travel of the projectile after the shot has been set in motion. Therefore, by means of the longitudinal perforations, the burning area is increased internally while the external surface is diminished by the attacking flame. Thus a measure of uniformity is secured, and the power back of the shell does its work until the projectile has acquired its maximum velocity during its journey to the rifle's muzzle. Therefore, the longer the gun the bigger or longer the grain needful.

It is not our purpose to go into the mechanical details of the

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POWDER ISSUING FROM PRESS ON TO CUTTING TABLE.

various presses employed. It is enough for us to know that their piston rods must be held tight, and to that end the best of rubber packing is employed. The same thing is required at pipe joints, and rubber tubing has many applications. This is especially so in plants where the solvent is made and also in the acid house, where the transforming chemical and its surphurous acid are drawn off into carboys for carriage to the nitrating house. The workmen in the acid house must also be safeguarded from these corrosive chemicals, and rubber gloves, rubber aprons and rubber boots are worn.

We have now seen how harmless cotton waste can be transformed into a smokeless propellent for guns, but a good deal remains to be done before the powder is in a condition for issuance to the naval service. The same can be said of the smokeless powder manufactured by the army at Picatinny, and

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IN THE LABORATORY OF A POWDER PLANT RUBBER HAS MANY USES.

is equally true of the explosive turned out at the numerous plants now commercially engaged in this work.

Finally, the powder is laid in shallow boxes or drawers in the drying house, and these receptacles are maintained at fixed temperatures. Gradually the powder grains darken and harden, and in about six months from the day of forming the stuff is ready to be submitted for ballistic testing, i. e., firing in guns of the proper caliber, and the registering of the pressures developed. Every batch of powder is called a "lot," and no two lots are exactly identical in their performances. In order to secure the desired average of performance, powders of different batches are mixed, and after testing the lot is given its "index." In this way the ordnance experts know just how to apportion the charge so that the propulsive effort of a succession of firings will be substantially alike.

Smokeless powder has revolutionized modern ordnance. Formerly the gun was fashioned to measure its strength with the explosive violence of black powder. The designer knew that he had to use so much of it to get a desired propulsive effect, and this explains the disproportionate bulkiness of the rear part of the older weapons around that portion of the bore in which the propellent developed its maximum effort with amazing suddenness. Today, on the other hand, the designer plans his gun first, using his metal more skilfully, and distributing it in a way that produces graceful tapering contours. Then, having fixed the physical characteristics of his weapon, he proceeds to design his powder grains so that they will burn progressively to harmonize with the construction of the rifle and the ultimate speed to be given the shell at the instant it leaves the muzzle. Smokelessness is an incident, and, as we have said, due to well nigh perfect combustion. The primary purpose of the chemist was to produce a propellent susceptible of the nicest control.

The manufacture of explosives has been given such a tremendous impetus in this country, as well as across the water, during the last six months, that it would be impossible to give the present statistics of this industry with exactness, but they can be approximated with considerable accuracy. At the time of the taking of the last census—in 1910—there were 6,274 workmen employed in the 86 plants in the United States devoted to

the manufacture of explosives. As the greater number of these plants are now working on considerably fuller time than has been the case before in years, and as new plants have recently been established, it would be safe to add about 60 per cent. to the number of workmen engaged in this sort of manufacture, as given in the census; so that it would hardly be an exaggeration to say that 10,000 men are now engaged in making explosives in the American powder factories of private ownership. To this number should be added 1,000 or 1,200 men engaged in the government plants, making not far from 12,000 workmen employed in American powder mills of one sort or another. Not all these men are compelled to protect themselves in a rubber equipment, but all who are employed in the initial stages of converting cotton into an explosive substance—where nitric acid is used—are compelled to wear gloves and aprons and boots made of rubber.

And this does not take into account at all the large number of workmen engaged in the factories that produce nitric and sulphuric acid. The necessity they are under of wearing complete rubber protection is even greater. But the ordinary rubber boots, gloves and aprons meant for general service are not immune to the action of strong acids, so that it is necessary to make the rubber equipment worn by workers in acid and powder mills of a special compound with particular reference to the trying conditions under which it is to be used.

THE RUBBER TRADE IN CANADA.

CANADIAN imports and exports of india rubber, gutta percha and manufactures of, for two fiscal years ending March, are officially stated to have been in value as follows:

IMPORTS—FREE.

	From United States.	From United Kingdom.	From Other Countries.	Total Value. 1915.	Total Value. 1914.
Crude rubber and gutta percha	$2,041,605	$814,591	$747,829	$3,604,025	$3,250,089
Reclaimed	775,426	3,672	2,346	781,444	893,595
Waste	83,407	25	519	83,951	131,498
Other	36,165	16	.....	36,181	28,827
Total	$2,936,603	$818,304	$750,694	$4,505,601	$4,304,009
Chicle	497,786	381,483	930,525	1,809,794	1,543,433

IMPORTS—DUTIABLE.

Belting	$77,532	$4,523	.....	$82,055	$87,825
Boots and shoes	100,352	26,044	$10	126,406	163,247
Clothing and waterproof cloth	51,780	752,473	562	804,815	1,683,365
Hose	88,151	3,140	.....	91,291	142,736
Tires	1,050,275	45,310	108,872	1,204,457	1,412,342
All other	693,438	227,296	31,502	952,236	1,200,777
Total	$2,061,528	$1,058,786	$140,946	$3,261,260	$4,690,292
Elastic, including garter elastic	19,983	113,341	982	134,306	148,249

EXPORTS OF CANADIAN MANUFACTURE.

	To United States.	To United Kingdom.	To Other Countries.	Total Value. 1915.	Total Value. 1914.
Belting	$68	$484	$1,722	$2,274	$5,475
Boots and shoes	9,445	59,032	128,627	197,104	170,852
Waste	276,128	.....	.....	276,128	413,953
All other	97,317	123,327	26,755	247,399	95,951
Total	$382,958	$182,843	$157,104	$722,905	$686,231

RE-EXPORTS.

Belting	$554	$398	$384	$1,336	$5,606
Boots and shoes	1,113	15	80	1,208	3,562
Waste	2,314	.....	.....	2,314	8,924
All other	1,290,433	2,874	2,893	1,296,200	431,529
Total	$1,294,414	$3,287	$3,357	$1,301,058	$449,621

A SUBSTITUTE FOR CHICLE.

A patent has recently been granted to George B. Bradshaw and William H. Bradshaw of Brooklyn, New York, for the composition and the process for making a substance having the properties of gum chicle. Rubbers of various kinds, such as Pontianak and Gutta Siak are deresinated and the resin obtained is then cleaned and triturated with dilute soda combined with sugar and is finally blown with superheated steam. [United States patent No. 1,134,073.]

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND MANUFACTURES OF.

Articles.	May, 1915. Quantity.	May, 1915. Value.	Eleven Months Ending May, 1915. Quantity.	Eleven Months Ending May, 1915. Value.
India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata .....pounds..free	124,327	$46,953	2,323,643	$907,542
Guayule gum	716,671	179,793	4,812,468	1,362,362
Gutta jelutong	279,846	17,335	13,244,030	654,763
Gutta percha	149,845	17,413	1,613,671	229,737
India rubber	16,350,431	8,239,993	153,282,616	73,324,551
India rubber scrap or refuse fit only for remanufacture	1,616,198	101,829	9,833,120	652,019
Total unmanufactured	.....	$8,603,316	.....	$77,130,974
Manufactures of—				
Gutta percha ....dutiable	.....	$136	.....	$10,704
India rubber .... "	.....	39,012	.....	739,256
Total manufactures of	.....	$39,148	.....	$749,960
Substitutes, elasticon and similar .....dutiable	.....	$94	.....	$27,832

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:				
Belgium .....pounds	.....	.....	1,902,370	$950,872
France	13,760	$6,880	675,168	279,780
Germany	.....	.....	739,105	358,931
Portugal	287,774	89,049	3,576,216	1,163,474
United Kingdom	8,693,294	4,704,260	66,274,674	34,481,240
Central American States and British Honduras	131,433	67,081	851,925	364,743
Mexico	153,396	67,007	1,565,355	613,453
Brazil	3,194,084	1,394,956	44,983,127	18,843,093
Other South America	524,780	199,495	4,476,082	1,900,418
East Indies	3,101,339	1,562,753	22,788,759	11,367,018
Other countries	250,571	148,512	5,449,835	3,001,529
Total	16,350,431	$8,239,993	153,282,616	$73,324,551

EXPORTS OF AMERICAN RUBBER GOODS.

India rubber, manufactures of:				
Scrap and old.....pounds	284,558	$39,247	2,056,564	$241,781
Reclaimed	364,298	48,931	5,356,947	745,270
Belting, hose and packing	.....	138,367	.....	1,629,331
Boots and shoes—				
Boots .....pairs	4,590	13,115	315,414	717,673
Shoes	107,254	50,003	2,120,631	2,005,489
Tires—				
For automobiles	.....	671,757	.....	4,224,408
All other	.....	101,675	.....	457,552
All other manufactures of	.....	417,155	.....	3,044,904
Total	.....	$1,480,250	.....	$13,066,408

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

Tires for automobiles:				
Germany	.....	.....	.....	$6,090
England	.....	$380,054	.....	2,289,493
Canada	.....	120,322	.....	661,722
Cuba	.....	22,170	.....	161,023
Mexico	.....	17,916	.....	98,966
Australia	.....	19,985	.....	180,721
Philippine Islands	.....	16,368	.....	225,807
Other countries	.....	94,942	.....	600,586
Total	.....	$671,757	.....	$4,224,408

EXPORTS OF FOREIGN MERCHANDISE.

India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata .....pounds..free	117,295	$55,347	1,023,995	$403,718
Guayule gum	22,731	6,365	24,891	6,991
Gutta percha	5,997	3,115	9,457	4,603
India rubber	204,778	95,147	5,993,843	3,166,650
Total unmanufactured	.....	$159,974	.....	$3,581,962
Manufactures of india rubber .....dutiable	.....	$28	.....	$5,506
Substitutes, elasticon and similar .....dutiable	.....	19	.....	364

A Nicaraguan law promulgated and in effect from March 20, 1915, suspends, until six months after the close of the European war, the export duty on rubber.

The Belgian Maritime Co. of Congo, is now using its steamers for direct trade between the Congo and Hull, England. Rubber, gums and palm oil are among the Congo products recently received in the initial shipment.

What the Rubber Chemists Are Doing.

FRANK GOTTSCH, of the Mt. Prospect Laboratory, Department of Water Supply, Gas and Electricity, City of New York, publishes in "The Journal of Industrial and Engineering Chemistry," July, 1915, an article on "Specification of Vulcanized Rubber Gum by Volume and Its Determination by a New Solution Method." Detailed methods of test and analysis are given, which contain certain matter original with the author under the headings of "Mineral Fillers," "Foreign Alcoholic Potash Extract," "Vulcanized Rubber Gum by Weight" and "Vulcanized Rubber Gum by Volume." His method for "Free Sulphur" is novel in the application of a well-known method for total sulphur to the free sulphur determination.

ANALYSIS.

FREE SULPHUR.—The dried acetone extract is entirely transferred to a 60 c.c. iron or nickel crucible by acetone, choloroform or benzol, and the solvents evaporated off on the steam bath and 6 grams of potassium carbonate and 4 grams of sodium peroxide are added. Mix, cover, heat at low temperature over asbestos shield to avoid sulphur fumes, until the mixture fuses, then bring to quiet fusion for 15 to 20 minutes. Avoid rapid heating and explosions and rotate the melt while solidifying. When cool put crucible and cover into a casserole with 200 c.c. of water, add 5 to 10 c.c. bromine water and boil melt till dissolved. Settle, decant, filter and wash through thick filter with hot water. Cool, acidify filtrate with dilute hydrochloric acid, make up to 400 c.c. and precipitate boiling with 10 c.c. of 10 per cent. solution of barium chloride.

MINERAL FILLERS.—A one-gram sample is extracted by acetone for four hours and the rubber dried in the water oven at 100 degrees Centigrade until the odor of acetone is gone. Transfer the sample to a 100 c.c. beaker, burn the thimble to ash and add it to the beaker. Add 50 c.c. of clear molten salol and heat the beaker on the hot plate at a temperature of not less than 120 degrees, nor more than 150 degrees Centigrade, stirring occasionally until the rubber is apparently dissolved. After settling, transfer the liquid to a 200 c.c. beaker and if the residue in the small beaker contains particles of undissolved rubber more salol is added and solution completed. Stir 2 c.c. of a 1 per cent. solution of soluble cotton in amyl acetate into the warm liquid in the 200 c.c. beaker, cool and add redistilled turpentine until a good "flock" has formed, adding at least 75 c.c. of turpentine with constant stirring. Allow the liquid to stand until the flock settles. The supernatant liquid is decanted and filtered by suction through an alundum crucible placed in a Spencer holder. Wash the flock by decantation with turpentine, filtering the latter; transfer the whole to the crucible, then dissolve carefully in a few c.c. of acetone, and wash the fillers with acetone, being careful not to allow the fillers to cover and clog the sides of the crucible. All beakers and the crucible are to be thoroughly washed with acetone. Dry to constant weight at 105 to 110 degrees Centigrade, cooling in a desiccator. Evaporate all the filtrate and washings, transfer to a weighed porcelain dish, burn off the organic matter. Add weight of residue to that of the fillers in the crucible and calculate as "mineral fillers."

FOREIGN ALCOHOLIC POTASH EXTRACT.—The dry rubber residue from the acetone extract is extracted with 50 c.c. of alcoholic potash, stoppered, in an air oven kept between 105 and 110 degrees Centigrade for 4 hours. Cool, filter and wash the residue clean with hot absolute alcohol. Precipitate potassium chloride by acidifying filtrate strongly with hydrochloric acid, settle, filter and wash with hot chloroform and evaporate the filtrate on a steam bath till odor of hydrochloric acid just disappears. Take up residue with chloroform, filter and wash with hot chloroform into a beaker, and evaporate to dryness. If the residue is not oily or greasy to touch, it may be disregarded. If oily or greasy the residue is washed with small portions of 88 degrees Beammé naphtha, filtered through a washed plug of cotton into a small weighed beaker, evaporated and dried in water oven at 95 to 100 degrees Centigrade in 15-minute periods until the weight is constant, or increases. The result is calculated as "foreign alcoholic potash extract."

VULCANIZED RUBBER GUM BY WEIGHT.—Subtract the sum of the percentages of free sulphur, organic acetone extract, mineral fillers and corrected foreign matter from 100 per cent. The balance is the vulcanized rubber gum by weight.

VULCANIZED RUBBER GUM BY VOLUME.—Multiply the percentage by weight of vulcanized rubber gum by the specific gravity. The product is that specified by the term vulcanized rubber gum by volume.

The author in his discussion states that his method for free sulphur is designed to absolutely obviate the influence of organic matter by its complete removal. Concerning estimation of mineral fillers, it is found that salol will dissolve soft rubber in less than an hour and vulcanite in from two to three hours. Owing to the condition of extreme fineness met with in many of the mineral fillers of rubber a coagulant is found necessary to filter them off, even through an alundum crucible. Such a coagulant is found in soluble cotton dissolved in amyl acetate. After discovering in salol a suitable solvent for vulcanized rubber gum, difficulty was experienced in finding a diluting agent which would not reprecipitate the rubber. Ether, chloroform and turpentine were the only satisfactory ones found. Of these only turpentine satisfactorily reprecipitates the soluble cotton used to form a flock suitable for filtration.

Vulcanized rubber gum by weight represents the pure gum (free of resin, ash, moisture and air) plus its combined sulphur. It is this vulcanized rubber gum that gives rubber goods their specific and desirable properties, and it is consequently specified and determined.

Vulcanized rubber gum by volume is more properly related to the physical properties and quality of rubber compounds than is the percentage by weight. This volume conception is necessary to an undertsanding of rubber mixings. The specific gravity of vulcanized rubber, without mineral fillers, has been shown to be safely taken at unity. No closer method of determining the volume is necessary than to multiply the percentage by weight of vulcanized rubber gum present by the specific gravity of the compound. This volume would be strictly correct if divided by the true specific gravity of the vulcanized rubber gum present, but the factor obtained as specified expresses the true volume close enough for practical needs.

The minimum vulcanized rubber gum by volume that will give a sound article can hardly be less than 55 per cent. if made up of rubber, sulphur and mineral fillers only. Less than this amount needs such materials as resins, oils, waxes or asphaltums to fill the pores between the particles of fillers. As the volume percentage of vulcanized gums decreases in a compound composed of rubber, sulphur and mineral fillers only, the liability of decay by oxidation increases. By specifying a minimum percentage by volume of vulcanized rubber gum the choice of fillers is left entirely to the manufacturer, as it should be. Whether he uses light or heavy fillers is immaterial as long as the volume specified is obtained and the chemical and physical requirements are met. The same result can be obtained by fixing a minimum specific gravity and a minimum percentage, by weight, of vulcanized rubber present, but the kind of fillers would then be limited to a few having a certain density. The method specified permits any manufacturer to make as good a compound as he

knows how, using good rubber and any fillers he thinks best. He will be on an equal basis of competition with any other manufacturer as regards quality of the finished article. He must necessarily deliver an equal weight of vulcanized rubber gum of quality to meet the physical tests.

FUNCTION OF LITHARGE IN VULCANIZATION.—Dr. Henry P. Stevens (Journal British Society of Chemical Industry, May 31, 1915), presents the results of his experimental study of this subject. The state of vulcanization of a rubber product is judged by its aging and physical qualities generally. These are correlated with the coefficient of vulcanization—that is the percentage of "combined" sulphur calculated on the rubber in the product. Too high a coefficient indicates overcure and too low a coefficient an undercured condition. The correct coefficient varies with the raw rubber and type of mixing; 2.5 to 3.0 having been found to correspond with the sum of best physical condition of freshly vulcanized soft rubber. The effect of litharge in promoting vulcanization is usually attributed to the rise in temperature resulting from the reaction; $4\ PbO + 2\ S_2 = 3\ PbS + PbSO_4$. One part of sulphur is almost the exact amount required for the conversion of seven parts of litharge to lead sulphide or sulphate. Assuming 2.5 as the coefficient of vulcanization of the rubber, it follows that a mixing containing 100 parts of rubber, 5 parts of sulphur and 17 parts of litharge will contain sufficient sulphur to correctly vulcanize the rubber and also to convert all of the litharge into lead sulphide. When the mixing contains a larger proportion of litharge than this there will be insufficient sulphur to fully vulcanize the rubber and convert all the litharge to lead sulphide. If rubber and litharge are practically equal in their avidity for sulphur, this will allow the use in practice of an excess of litharge without danger of overcuring the product, provided the amount of the sulphur is restricted. The analytic data presented bear out this view and show that the coefficient of vulcanization falls when the proportion of sulphur is insufficient to convert all of the litharge to lead sulphide, and at the same time leave sufficient to cure the rubber fully.

In his investigation the author employed air-dried plantation sheet rubber of good quality. The conclusions reached were: (A) That the addition of litharge in moderate quantities increases the coefficient of vulcanization. (B) That the maximum coefficient of vulcanization is obtained where there is just sufficient sulphur to cure the rubber fully and to convert all the litharge to lead sulphide and sulphate. (C) That increasing proportions of litharge cause a progressive reduction in the coefficient of vulcanization, a larger percentage of lead sulphide and sulphate being formed. (D) That the percentage of free sulphur drops suddenly at the point where the rubber is fully cured. (E) That even with large proportions of litharge a little free sulphur always remains.

RESEARCH.

The work of C. Harries and E. Fonrobert on the constitution of the caoutchouc molecule (Journal Society of Chemical Industry, 1915, pp. 277-279) indicates that it must have a molecular formula at least $C_{25}\ H_{40}\ O_{15}$.

O. Lichtenberg (Journal Society of Chemical Industry, 1915, pp. 279-280) shows the close relation of the chemical regenerates obtainable from caoutchouc and gutta percha. The transformation products of caoutchouc hydrogen halides and their thermal dissociation are described.

The swelling of caoutchouc in organic liquids has been studied by D. Spence and G. D. Kratz (Journal Society of Chemical Industry, 1915, p. 280. The capacity to swell in contact with organic liquids is not common to all kinds of caoutchouc, but is limited to the raw material. Pará caoutchouc, which has been washed, dried and milled, is no longer capable of swelling. This change is occasioned by even slight milling or rolling. The swelling power of Pará caoutchouc varies with the samples. If the liquids obtained from the solvents are arranged in decreasing order according to the volume of liquid absorbed by one gram of caoutchouc the series is (1) carbon tetrachloride and chloroform, (2) carbon bisulphide, (3) benzene, toluene and xylene, and (4) ether.

PATENTED TREATMENT OF RUBBER.

RUBBER PAINT is manufactured by the British Patent Subrite Co., Ltd., under British patent No. 7,087, 1914 (E. G. Meadway). Gum mastic is added to a solution of rubber in naphtha and the mixture added to a solution of celluloid in amyl acetate.

ACCELERATORS.—British patent No. 7,370 (1914) granted to S. J. Peachy, relates to hastening vulcanization by a compound resulting from interaction of an amine of the cyclic series, with an aldehyde of the aliphatic or of the cyclic series; or of an aldehyde of the cyclic series with ammonia.

UTILIZING WASTE RUBBER.—In British patent No. 10,030 (1914) granted to H. Gare, vulcanized rubber is reduced to a paste by grinding in water and then compressed under heavy pressure.

SEPARATING CAOUTCHOUC, GUTTA PERCHA OR BALATA FROM LATEX.—In German patent No. 280,848 (1913) granted to H. Colloseus, instead of alkali specified in former patent (259,253) any substance is added to the latex which reacts with alkaline earth or salts of heavy metals with formation of compounds insoluble in water; such as water glass, borax, sodium phosphate, etc. The double decomposition of sodium sulphate with salts of alkaline earths readily coagulates the latex. The same result is produced by carbon dioxide in presence of alkaline earths. Emulsifying agents named include soap, albumin and the serum remaining after coagulation of caoutchouc.

VULCANIZING PROCESS.—In British patent No. 13,571 (1914) granted to A. Cockburn, solid tires and other massive articles are rendered non-porous by vulcanizing under pressure of about one ton per square inch by means of a liquid filling the annular space between a steel or iron mold and the article. The article is wrapped in a suitable flexible covering before being placed in the mold.

Fabrics as foundations in vulcanized rubber goods are preserved from injurious effect of sulphurous and sulphuric acids by impregnating with (1) additive compounds of ammonia with salts such as zinc sulphate and magnesium sulphate; (2) acetic or other organic acid, which is afterwards acted on by ammonia or other alkali; (3) ammonia and carbon dioxide applied together in succession, preferably under pressure during vulcanization; (4) ammonia applied alone, preferably during vulcanization. [W. E. Muntz. English patents No. 4,910—1913 and No. 3,158—1914.]

S. J. Peachey, (British Patent No. 4263, February 19, 1915). Para-nitroso-dimethylaniline or its homologues, such as para-nitroso-methylanaline, or para-nitroso-ethylanaline are employed to accelarate vulcanization. In an example, 100 parts of rubber are mixed with 10 parts of sulphur and 0.5 part of accelerating agent, the mixture being heated for 20 minutes at a temperature of 135 degrees—145 degrees Centigrade.

LEATHER OR RUBBER SUBSTITUTE.—English patent No. 13,128 (1914) has been granted to E. B. Cook for a composition of matter containing rubber, reclaimed rubber, sulphur, litharge, a filler such as tripolite, coloring matter and leather fibers.

DESTRUCTION OF RUBBER BY MICROBES.

It is said in the "Revue Scientifique" that microbes do not attack commercial rubber which is kept in dry air, but when a small amount of moisture is present certain bacteria and moulds derive nourishment from the albuminoids, resins and sugars which the rubber contains. Some microbes form on the rubber, making spots of various colors—red, yellow, black or brown—but the rubber is not materially altered thereby. On the other hand, two species of *actinomyces*, very common in garden earth and in canals, *actinomyces elastica* and *a. fustus*, assimilate the hydrocarbons of the rubber, and are in consequence capable of modifying its properties in such a way as to deprive it of all commercial value.

New Rubber Goods in the Market.

RUBBERIZED FEATHER FOR THE BATHING CAP.

A LATE novelty in bathing caps is shown in the illustration herewith. This is known as a Robin Hood cap, and it is decorated with a quill feather made impervious to the effect of water by rubberization. [Parker, Stearns & Co., Brooklyn, New York.]

A NEW CLOSET SEAT BUMPER.

The Star bar bumper is a new type of buffer for reducing the impact of the closet seat on the bowl. It differs in several details from similar articles of this nature hitherto marketed, including that of quality of material employed, being made of a higher grade of rubber than has generally been utilized in the manufacture of closet seat bumpers. As indicated by the accompanying cut, this buffer is of elongated formation. It is attached to the under side of the seat so that it will lie across the bowl, the nails or screws securing it to the seat—for which special provision has been made in the depressions to be noted at either end—extending beyond points of contact with the edges of the bowl. [The Closet-Seat Bumper Co., Cincinnati, Ohio.]

THE BROWN SAFETY ROBE RAIL.

A distinctive feature of the new Brown Safety Robe Rail is its rubber-faced grips. The cut herewith shows one jaw open to receive part of the robe or garment. One or two turns of a specially designed key closes this jaw firmly on the wrap so that

it cannot be removed without first unlocking the rail. These jaws are faced with pyramid rubber, which has been found to be the only material suitable for this purpose, providing, as it does, the tenacity to make the device efficient by exerting sufficient pressure to hold the garment without tearing it. [Minnesota Motorobe Co., Duluth, Minnesota.]

AN AUTOMOBILE RAIN SHIELD.

This illustration shows the new U-Can-C rain shield as attached to the wind shield of an automobile. It is made of transparent Pyraline and is attached to the glass by means of five rubber vacuum cups about an inch in diameter and having small buttons at the top by which they are pressed firmly against the glass. A strip of rubber packing at the back of the shield makes it impossible for rain to run down the glass and obscure the driver's view of the road. [Frey Manufacturing Co., 1514 Michigan Boulevard, Chicago.]

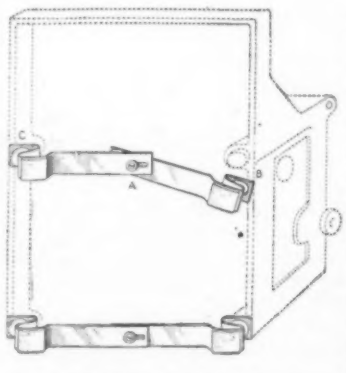
TIRE MILEAGE RECORDING DEVICE.

The return to a manufacturer of a worn pneumatic tire with the claim that it has not lived up to the guaranteed mileage is usually the basis for an argument. Often the manufacturer is unable to prove that the tire has fulfilled the guarantee and rather than have his customer dissatisfied he settles the claim.

The device shown in the illustration is intended to protect the manufacturer by indicating the extent of use to which a tire has been subjected. A metal tube *A* is imbedded in the bead when the tire is made, at a location supposed to be known only to the manufacturer. One end is closed and the other threaded to receive a plug *B* of gutta percha or other material of uniform density. The head *C* has a boring bit *D* and moves freely within the metal tube, which is preferably placed, with the plug, toward the front. When the wheel revolves the ball *E* is lifted and then dropped by gravity, delivering a blow on the head *C* at each revolution of the wheel and driving the bit *D* into the plug *B*. The length of the plug is so calculated that when a sufficient number of revolutions of the wheel has been made the boring bit will have completely penetrated the plug. Thus if the tire is guaranteed for 3,500 miles the plug will be punctured only after approximately 3,500 miles' usage, and the plug will be bored into for only a proportionate part of its length if less than this distance has been traveled. [Fred B. Carlisle, assignor to Revere Rubber Co. United States patent No. 1,137,697.]

TYPEWRITER SILENCER WITH RUBBER PADS.

The Universal Silencer, a cut of which appears below, is designed to decrease the noise of typewriter operation and to render the machine lighter and easier running. It consists of metal strips connected in the center and bent at the ends to form springs. A hole in the end of the spring permits of its adjustment over the rubber feet of the typewriter. Thin corrugated rubber pads about an inch square are attached to the bottom of the springs, four pads to each typewriter, to prevent it from slipping on the desk. [The Universal Appliance Co., 374-6 Canal street, New York.]



A full chemical fire fighting equipment, mounted on a standard Ford chassis provided with oversize pneumatic tires, is a new feature of fire apparatus. It carries 200 feet of ¾-inch four-ply red rubber chemical hose, in sections of 50 feet each.

"SEMIBRONZE" TUBULAR GASKET AND "GARCO" TAPE.

The purpose of the Semibronze tubular gasket illustrated is to provide a gasket that will be unaffected by heat, acids, gases, moisture, etc., and by its construction make a tight joint in almost every place, regardless of how rough or uneven the surface. It is intended for high pressure steam and is a combination of high grade asbestos metallic sheet with a metal center. It may be shaped to any flange desired and will retain its form.

The asbestos cloth used in the manufacture of this product is treated with rubber cement before being made into tape. This is also true of the asbestos material used in the construction of the Garco Perfect Adjustable Gasket Tape, a new flat gasket material recently put on the market. This tape is put up in continuous rolls, in boxes containing ten to twelve pounds, and from it gaskets of any desired size can be made, without waste or the use of other equipment. This type of gasket is suitable for use in boilers, pipes and the like and is guaranteed by the manufacturer for any pressure, as well as not to burn or blow out. [General Asbestos & Rubber Co., Charleston, South Carolina.]

THE "COLONEL" ERASER.

The makers of the famous "Colonel" golf ball have turned their attention to the production of rubber erasers, a full line of which is now being marketed. This eraser is stated to be superior in quality and the result of exhaustive experiments. It is made in all the forms in which rubber erasers have become familiar, for general and specific requirements. For typewriter use it is made in circular shape as well as in the flat strip with bevel edge. A soft, velvety and quick acting eraser, in red or white, is made for architects and draftsmen, and a green beveled rubber for use on tracing cloth. The pencil eraser for general use is made of a firmer quality of rubber, in red and green. [St. Mungo Manufacturing Co., Glasgow, Scotland.]

FIREPROOF GAS TUBING.

Fireproof gas tubing for use with portable lamps and appliances is now being made, in which a layer of chicle is employed. This tubing is made up with an inside layer of spiral wire, outside of which are successive layers of waxed fiber, woven material, chicle, twine binding fiber and asbestos, with an outer cover of spiral wire. [New York Gas Tubing Co., 97 Bank street, New York.]

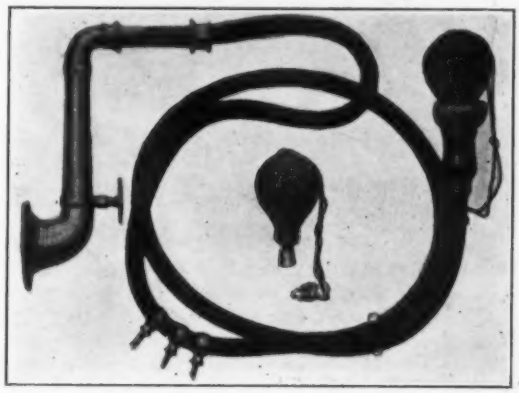
Golf players who feel an irresistible impulse at the beginning of a stroke to turn the head to see where the ball will probably go, may be interested in a device intended as an aid to the suppression of this inclination. It consists of an elastic cord or tube with a soft rubber mouthpiece, attached to a belt. The golfer is reminded by a sudden tug on the mouthpiece—which he holds in his teeth—each time he involuntarily turns his head.

RUBBER HOB NAIL.

A rubber hob nail which when applied to the soles and heels of shoes prevents their scratching or damaging polished floors is illustrated herewith. This hob is provided with a center nail for ease of attachment to the shoe. [Alex. Taylor & Co., Inc., 26 East Forty-second street, New York.]

SPEAKING TUBE AND CALL SIGNAL.

Here are illustrated two new articles in rubber being offered by a leading English firm which has a special department devoted to the manufacture of rubber accessories for domestic use. The first is a speaking tube of rubber, made in diameters of 5/8, 3/4 and 7/8 of an inch and covered with



braided worsted or silk or with the two combined. Attached to the tube is a silk-covered rubber bulb, pressure on which causes a whistle to blow at the other end of the tube. This is a type of speaking tube recommended also for automobile use.

The second illustration is of a device known as the invalid's friend, being a call signal for use of invalids. It consists of a length of flexible worsted-covered rubber tubing with an inflated rubber ball mounted on a brass or wood cup

at one end and a call signal on the other. The tubing leads from the invalid's couch to any desired point, and a slight pressure on the rubber ball is sufficient to sound the signal in another room. [Sheath Bros., 87 City Road, London, England.]

SELF-VULCANIZING REPAIR PRODUCTS.

Several products for the repair of rubber goods are now being offered which require neither cement, driers nor heat in their application, being self-vulcanizing. Vulcanizit, Kutfiller, Sandblist and Newtred are the names applied to the tire repair products, each suggestive of the particular use for which it is intended; while Patchit is a preparation, in white or black, for the repair of air cushions, hot water bottles, footwear, etc. These preparations are sold under guarantee of the manufacturers. [Self-Vulcanizing Products Works, Morristown, New Jersey.]

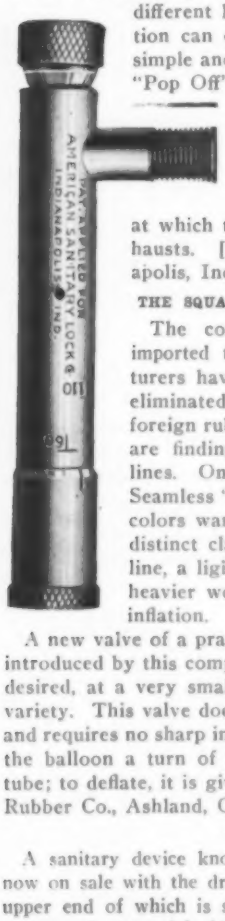
RUBBER IN BUNION RELIEVERS

Among the new devices for the relief of foot troubles is the one shown in the accompanying cut, the Wizard adjustable bunion and callous remover and arch builder. This device is worn inside the shoe, being an insole of fine, smooth leather with pockets arranged for the insertion of soft, round rubber pads varying in thickness from one-sixteenth to one-quarter of an inch at the center and tapering to a very thin edge. The illustration shows these rubber pads inserted in two of the four pockets, which are supposed to come directly back of the bunion or callous

place. By relieving pressure on the joints, the device is supposed not only to build up the arch but also to remove callous places and corns from the bottom of the feet. [Wizard Foot Appliance Co., St. Louis, Missouri.]

THE "POP OFF" TIRE GAGE.

In order that tires may give most satisfactory and lasting service various degrees of air pressure are recommended for different loads; and the degree of a tire's inflation can only be measured by a tire gage. A simple and inexpensive device of this kind is the "Pop Off" gage, a cut of which is here shown.



In use, the indicator is set at the desired amount of air pressure and the air line or pump is fastened to the side of the gage and started. When the pressure reaches the point at which the indicator is set the surplus air exhausts. [American Sanitary Lock Co. Indianapolis, Indiana.]

THE SQUAWKER BALLOON WITH PATENT VALVE.

The competition of the cheap hand-made imported toy balloon, which American manufacturers have never been able to meet, has been eliminated for the present by the situation in foreign rubber manufacture, and home producers are finding readier sales for the higher-grade lines. One of these is the "Faultless" Quality Seamless "Squawker," which is made in assorted colors warranted fast and non-poisonous. Two distinct classes of balloons are included in this line, a light weight for inflating with air, and a heavier weight, chemically treated type for gas inflation.

A new valve of a practical and simple nature has also been introduced by this company and is used in its balloons where desired, at a very small advance in price over the ordinary variety. This valve does away with the use of the reed stock and requires no sharp instrument to operate it. After inflating the balloon a turn of the valve to the right closes the air tube; to deflate, it is given a turn to the left. [The Faultless Rubber Co., Ashland, Ohio.]

A sanitary device known as the "Renelise" nipple turner is now on sale with the drug trade. It is a solid glass stand, the upper end of which is so formed that rubber nipples of every sort may be turned inside out over it, facilitating their sterilization. [Renelise Nipple Turner Co., 5859 Romaine street, St. Louis, Missouri.]

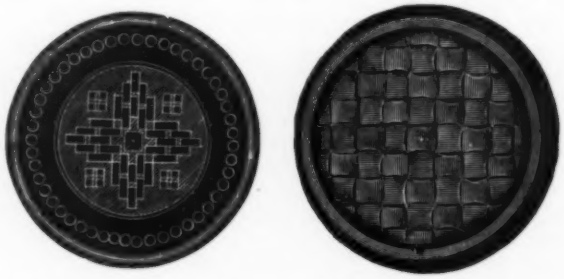
DRIPLESS POUR REGULATOR.

The accompanying illustration shows an entirely new and practical bottle closure and pouring device, the intention of which is to eliminate the annoyance of dripping which follows the pouring of liquid from bottles, and also to preserve the purity and quality of the bottle's contents.

As illustrated this closure is made for an ink bottle and is of hard rubber substitute, although the practicability of such a stopper made of rubber, in the bottling of various liquids, is easily apparent. The stopper, on which patent has been applied for, has a liquid outlet near the top, also an air vent on the other side. By a turn of the spout to the right the bottle is hermetically sealed, insuring the preservation of its contents. To open the pourout, the spout is turned to the left until it stops, when a perpendicular stream can be poured from the outlet. The flow can be regulated by applying the finger to the air vent. [S. S. Stafford, Inc., 603-9 Washington street, New York.]

HARD RUBBER HARNESS ROSETTES.

The accompanying illustrations show two late designs in hard rubber rosettes, a very extensive line of which is being turned out by the manufacturers for use in connection with hard rubber trimming for fine and medium grades of harness. Hard rubber as a trimming for harness is not a new idea, but the variety



of designs and extent of its use have rapidly increased since its introduction for this purpose. As a harness trimming it is said to be almost indestructible, outwearing the leather parts in all cases, and it is held in great favor by harness makers and drivers also because of the ease with which it may be cared for. [Rubber & Celluloid Harness Trimming Co., Newark, New Jersey.]

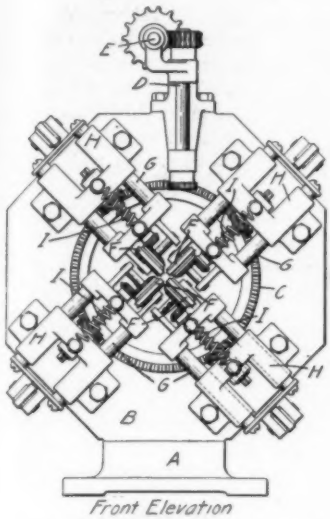
A molded soft rubber cushion or anti-rattler fitted over the natural teeth has been found effective in absorbing the jar and chattering caused by rapid driving over a brick-paved speedway in racing. This device was worn by Art. Klein in the recent 500-mile race on the Indianapolis Speedway.

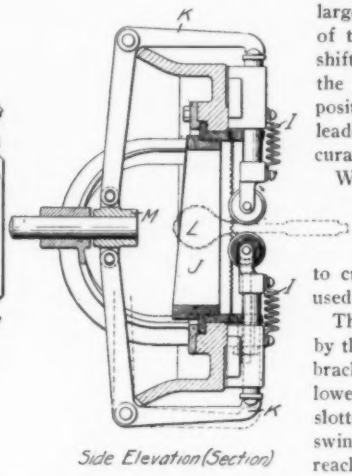
There has recently been developed and is being opened to the trade a material having properties between the formaldehyde products, such as Bakelite and Condensite, and the best known grades of shellac compositions. This new material is styled "Grade 57-Hi-Heet." It has a heat resistance of 250 degrees Fahrenheit, can readily be molded in any form or size, has a tensile strength superior to shellac compositions and a dielectric strength of 285 volts at a thickness of 250 mils. The main advantage of this material is high heat resistance, and lower cost than the formaldehyde products. [The General Insulate Co., Brooklyn, New York.]

New Machines and Appliances.

TOY BALLOON STRIPPING MACHINE.

IN the manufacture of toy balloons the operation of stripping the molds by hand is very tedious and is accomplished with difficulty. The illustration shows Edwards' invention for doing this work mechanically. Referring to the front elevation





shown in the illustration, *A* is the base which supports the frame *B*, in the central opening of which revolves a ring gear *C*, driven by the upright shaft *D* from the driving shaft *E*.

The four rubber covered stripping wheels *F* are mounted on separate shafts journaled in sliding frames *G*, that slide in brackets *H* secured to the frame *B*. The stripping wheels are driven from the ring gear *C* by bevel gearing and are kept apart by the four springs *I*. Referring to the side elevation (section) in the illustration, the mold *L* is shown in the position for stripping off the balloon. The cam *J* revolves with the gear ring and acts on the four bell cranks *K* and the sliding collar *M*, throwing the stripping wheels together and in firm gripping contact with the mold.

As the mold is pulled outward by the operator the springs tend to force the stripping wheels apart, while the cam, acting through the bell crank levers, holds them positively in firm contact with the irregularly shaped mold, and strips off the balloon. [Bruce V. Edwards, assignor to Edwards Engineering & Manufacturing Co. United States patent No. 1,142,945.]

PATTEN'S SOLE CUTTING MACHINE.

In machines of this class it is often necessary to make an abrupt change at one or two points in the travel of the leader. At such times lost motion or vibration may cause a slight movement of the leader resulting in defective cutting of the material.

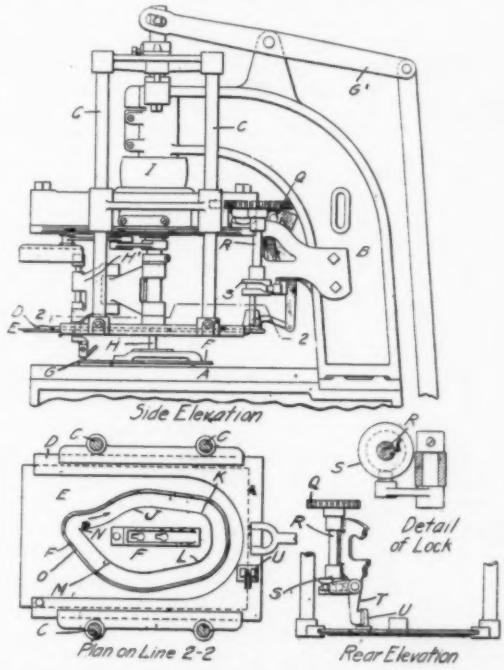
This invention provides means for holding the leader immovable during the travel of the knife and also for accurately registering it when it is to be held stationary.

Referring to the side elevation in the illustration, *A* is the base plate and *B* the curved frame that supports the operative parts of the machine. Secured to the lower ends of the four vertical rods *C* are two slide ways that support the slide *D* to which is fastened a leader *E*. This co-operates with the knife form *F* in guiding the knife *G* throughout the circuit of its travel. The form *F* acts as a presser foot to hold down the work and is secured to the lower end of the stem *H*, which is raised and lowered by the lever *G'*. The knife carrier *H'* is mounted on the stem *H* and is swung around the axis of the rod by the usual devices operated by the belt pulley *I*.

Referring to the plan on line 2-2, when a tap is being cut of the size for which the opening has been designed, the leader is held stationary while the knife completes the circuit. In cutting a tap larger than the regular size, as the knife travels in the direction of the arrow from the point *J* to *K* the leader and slide are shifted to the right and while the knife is passing from *L* to *M* the leader and slide are shifted back to the left to their first position. Throughout the remainder of their operation the leader and slide are held absolutely stationary, to insure accurate cutting, especially around the point *N*.

When smaller taps are to be cut the leader and slide are moved to the left as the knife passes from *J* to *K* and to the right in passing from *L* to *M*. While the leader is designed for a middle or intermediate size, it is also used to cut either larger or smaller taps—a different form *O* being used for each size that it cut.

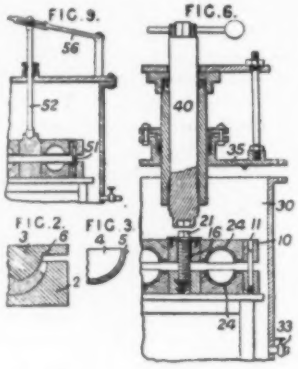
The rear elevation shows the slide locking device driven by the gear *Q* that is fixed to the upright shaft *R* journaled to a bracket bolted to the frame *B*. The cam *S* is attached to the lower end of the shaft *R* and operates the arm *T* that engages a slotted lug *U* fixed to the leader slide. The cam is timed to swing the arm into engagement with the lug when the knife reaches the point *M* and to hold it firmly while the knife passes from *M* around *N* to *J*. When the knife reaches *J* the lug is released while the knife travels from *J* to *M*. When the wedge-



shaped arm engages the lug the leader is accurately positioned and firmly held. By means of an adjusting screw the arm *T* can be adjusted to compensate for wear of the cam, the lug or the arm. [Ernest L. Patten, assignor to Wellman Co., United States patent No. 1,144,429.]

HOLLOW BALL MOLD AND PRESS.

Inflated balls are made by first forming the sections *4* (see Fig. 3) in a mold as shown in Fig. 2. This consists of a lower and an upper mold, *2* and *3*, respectively, the latter having an annular groove *6* which forms a flange *5* with a thin outer edge on each molded section *4*. The sections are then placed in the mold cavities *24* (see Fig. 6) of the combined mold and press *10*, which is enclosed in a vessel *30*.



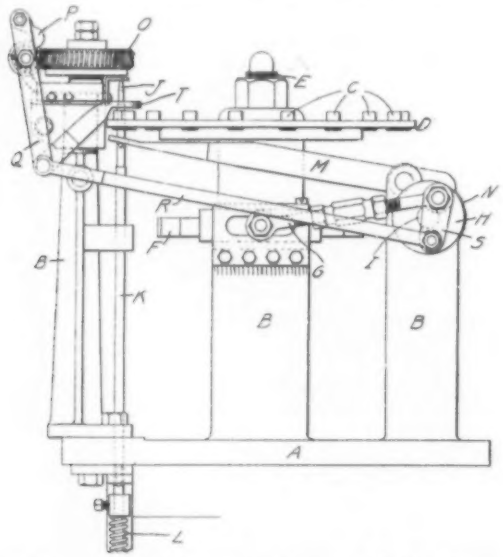
The press and mold consist of upper and lower dies aligned by dowel pieces *11* and opened and closed by a screw *16*. This has a square head *21* and is turned by the spindle *40* that passes through the cover *35* of the chamber *30*. Compressed air is forced into the chamber through pipe *33*, the molds are closed and steam applied until the balls are vulcanized.

Fig. 9 shows a modification in which the upper mold section is supported upon springs *51* and the molds are forced together by a vertical shaft *52* operated by a lever *56* and a counterweight. [R. H. Rosenfeld and F. T. Roberts, Trenton, New Jersey. British patent No. 4,623, 1914.]

MACHINE FOR PUNCHING NIPPLES.

The object of this invention is to provide a machine for punching the central holes in nipples, of any size that may be required, in a rapid and uniform manner.

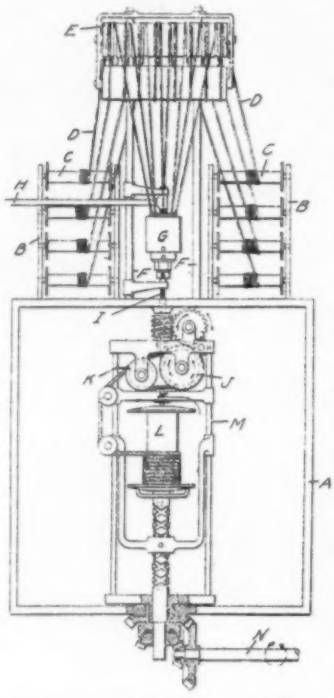
The base *A* rests on a suitable bench or table and carries the three standards *B* that support the operative parts of the machine.



The nipples to be punched are placed on the thimbles *C* arranged in a circle on a head *D* that revolves on the upright spindle *E*. The head is turned intermittently by the horizontal ratchet-wheel *F* and pawl attached to a slide reciprocated by the connecting rod *G* driven by the disc crank *H* upon the driving shaft *I*. The nipples on the thimbles are punched by the punch *J*, carried on a rod *K* which extends down through the base and is raised normally by the spring *L*. The punch rod is forced down intermittently by the pivoted lever *M* which is operated by the cam *N*, and the punching is done by the action of the spring. The punch block *O* is revolved by worm gearing that is moved intermittently by a pawl *P*. The levers *Q* and *R* are connected to this pawl and are driven from the main shaft *I* by the crank arm *S*. As the head *D* rotates the hook-shaped lever *T* removes the punched nipple from the thimble. The size of the holes is regulated by raising and lowering the stretcher plate interposed between the punch *J* and the punch block *O*. [Jeremiah L. Mahoney. United States patent No. 1,144,045.]

MACHINE FOR MAKING TUBULAR CORD.

Tew's machine twists the strands of yarn into a hollow cord and at the same time impregnates them with rubber solution. This not only cements the strands together but insulates them and prevents the wearing of one against the other.



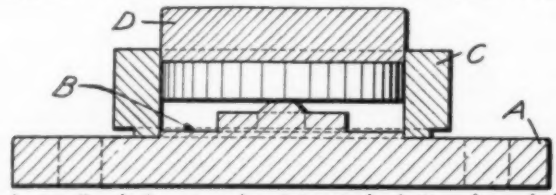
Referring to the illustration, which is a side elevation, *A* is the frame of the machine and *B* the uprights that support the bobbins *C*. The strands *D* are led over guide rollers *E* mounted in the top frame which is supported by the standards *F*. The strands then pass down through the stationary casing *G*, in which they are impregnated with rubber solution supplied through pipe *H*.

Within the casing the strands converge about a conical former and pass through a tubular die that acts as a guide for the cord *I*. The completed cord then passes through the hollow journal of the frame and around guide pulleys *J* and *K* to the bobbin *L*. When the frame *M* is rotated by bevel gearing connected to the driving shaft *N*, the strands are twisted into a tubular cord, which is drawn down and wound up on the traveling bobbin. [J. D. Tew. British patent No. 12630-1914.]

WASTE RUBBER HEEL MOLD.

The object of this invention is to provide a mold by which a heel can be made from vulcanized rubber waste without risk of the mold bursting and without any "spew" on the edges.

The mold is made of steel, in three parts, as shown in the illustration: A base *A*, which is in the form of a plate; a central part *B*, which is raised and forms the bottom face of the mold, and a ring *C*, which forms the vertical wall of the mold.



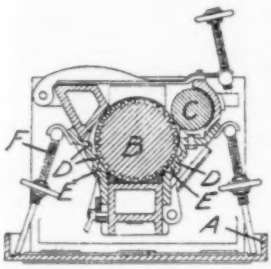
The ring *C* at its base fits concentrically around the part *B* and receives a ram or plunger, *D*, which has a close piston-like fit and is designed to slide within the ring *C*.

The central raised part of the plate is suitably engraved with the brand or name which the finished heel is to carry.

In making heels, the piece of rubber waste, which has previously been cut to the approximate size and shape, is inserted—the ram or plunger being removed—in the ring *C*. The ram is then placed in position on the rubber in the ring, the upper surface of the rubber lying just below the top of the ring, and the mold thus charged is placed under a screw or other form of press for giving the necessary pressure. [S. Cooke and W. C. Davis, of England, United States patent No. 1,140,577.]

A NEW ENGLISH WASHER.

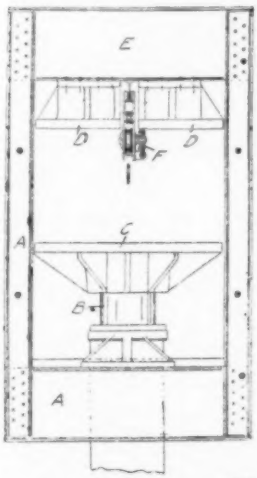
This machine, for washing rubber, particularly rubber mixed with bark, sand, etc., is mounted in a trough *A* and consists of an inclined grooved roller *B* and one or more plain rollers *C*. The roller *B* is driven by gearing and the rollers *C* either frictionally or by gearing. The material is supplied through a hopper and forced along the rollers towards the upper end by means of inclined guides. The sides of the casing are formed with a number of longitudinal projections *D* and pockets *E* co-acting with the roller *B*. The sides of the casing are hinged and held in place by adjustable struts *F*. Parts of the apparatus may be steam-jacketed. Water is admitted near the upper end of the machine, and the sand, etc., is discharged at the lower end into a tray and thence into the trough *A*, which has strainers to retain the rubber. [W. G. Gass, British patent No. 1,200, 1914.]



The same inventor has patented a washing, macerating or crêping machine with a hinged roller that can be readily removed from the bearings. [British patent No. 1,199, 1914.]

HYDRAULIC SOLID TIRE PRESS.

The ordinary press used in applying solid tires to heavy rims or truck wheels is not designed to facilitate the handling of heavy weights. A German invention, however, provides a press with a divided head, and an overhead track with a traveling hoist capable of loading and unloading heavy wheels or rims directly on the platen of the press.



Referring to the illustration, the forged steel base *A* supports the hydraulic cylinder and ram *B* upon which is mounted the platen *C*. The head *D* is made in two parts which are bolted to the crosshead with sufficient space between to accommodate the overhead track and chain hoist *F*. [Continental Caoutchouc & Gutta Percha Co., Hanover. German patent No. 628,518.]

OTHER DEVICES

MACHINE FOR TESTING HARDNESS.—This invention is a device by which the hardness of material is measured by the penetration of a hard ball under an adjustable load and the result indicated on a vernier. The operation is as follows: The piece to be tested is placed on the anvil and by manipulation of the levers the ball is brought into contact with the surface to be tested. At this stage there is no load on the counter-balanced lever. Two rods connected with the indicating mechanism are adjusted to just touch the test piece when the index reads zero. Through the system of counterbalanced levers, weight is applied, causing the ball to sink into the test piece. The hand crank, sprocket wheels and chain are used to raise and lower the weights. The depth of penetration is directly proportional to the hardness of the material and the reading on the scale is made to indicate this, by proper calibration, in terms of the units desired. [Tinius Olsen, United States patent No. 1,141,881.]

BARDER'S VULCANIZER DOOR.—The door is provided with two series of circumferentially spaced lugs extending outwardly. The shell has two series of spaced lugs extending inwardly, the spacing being arranged to permit the lugs of the door to pass through. By a partial rotation of the door the various lugs are made to interlock, thereby effectively sealing the vulcanizer. [B. R. Barder, United States patent No. 1,144,683.]

BRAIDING MACHINE.—Lundgren employs in this invention a fixed annular trackway for the independent carriers. He also divides the actuating mechanism for the set of separate carriers for one set of thread-supplying devices, by the path through which the threads of the other set of thread supplying devices are moved, and supports part of the mechanism on one side and the other part on the other side of the path. [J. Lundgren, assignor to the Carlson-Wenstrom Manufacturing Co., United States patent No. 1,144,716.]

CAR VULCANIZER.—It consists of a clamp and two plates between which the part to be vulcanized is held. On the upper plate is placed a block of slow burning material of such size that when ignited it will generate sufficient heat to completely vulcanize the repair. The following slow burning compositions are suggested: (1) potassium nitrate 25 gr., gum 20 gr., potassium chlorate 5 gr., charcoal 8 gr., cascarilla 10 gr., ground glass 9 gr., plaster of paris 10 gr., wood dust 8 gr., Venetian red 10 gr.; (2) wood dust 3 gr., potassium nitrate 30 gr., tragacanth 5 gr., gum 5 gr.; (3) charcoal 224 gr., coarse prunella 256 gr., chlorate of potash 32 gr., infusorial earth 160 gr., gum 120 gr., water 5 drams. [W. H. Miles, British patent No. 4,313—1914.]

REPAIR VULCANIZER.—The heating and pressure surface is formed by a plaster cast of the part to be repaired. Deep cuts are temporarily filled with soap so that they are not molded. The plaster cast is carried by a support that is fastened to a steam chamber or other heating device. [H. C. Reading, British patent No. 4,283—1914.]

COLLAPSIBLE CORE.—The adjacent ends of the four sections have slotted flanges and are held in alignment by flange plates which are slotted to receive the clamping bolts. In assembling the core three sections are placed together and the bolts moved in locking position and fastened. The key section is then aligned and the bolts slid in place and fastened. In removing the core from the casing the bolts are loosened and slid out of the locking position, and the key section removed. The other sections are then easily removed from the casing. [P. E. Welton, United States patent No. 1,144,671.]

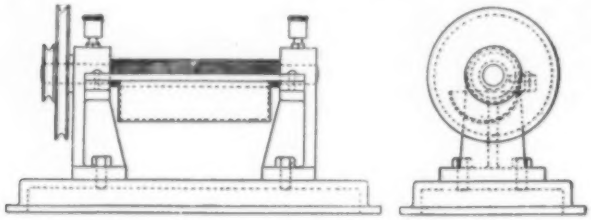
LATEX COAGULATED APPARATUS.—A grooved, corrugated, perforated or plain horizontal drum is mounted in a smoke chamber and is revolved by a hand crank in a trough containing latex. The smoke is led from a furnace to the smoke chamber by a pipe which terminates in the trough at a point near the surface of the latex. [R. S. Agar, Ceylon. British patent No. 6,215, 1914.]

MACHINE FOR PREPARING VULCANIZED RUBBER FOR ANALYSIS.

R. Wheatley and B. D. Porritt have perfected a simple device for the above purpose by which the essential requirements of correct sampling are met, namely, accurate representation, uniformity and suitability of condition for analytic treatment and speed of sampling.

The machine has a bed-plate 7 x 14 inches on which a pair of pedestals is mounted to carry the bar supporting the objects for sampling, and the tray to receive the sample, also

the cutting roll. The latter is a cylindrical file, 1 inch in diameter by 6 inches long, mounted on bearings and driven by a one-eighth horse-power electric motor belted to either of two grooved pulleys by means of which variable speeds may be imparted to the roll. The preferable speeds are 1,200 and 2,400 revolutions per minute, corresponding to surface speeds at the cutter of 314 and 628 feet per minute. The lower speed



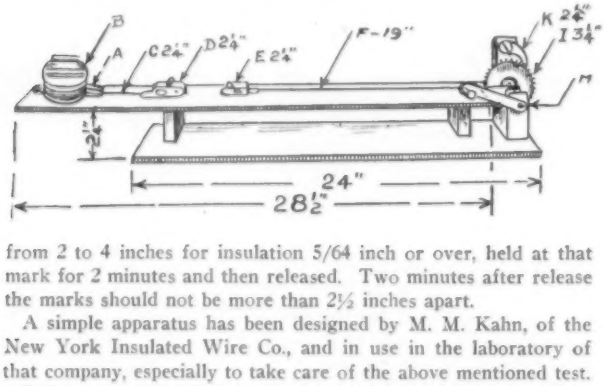
is adapted to the harder qualities and the higher to the softer qualities. The machine samples effectively all grades of cured rubber from vulcanite to pure soft rubber.

By its use small samples of vulcanized rubber are prepared without change of composition. Owing to its finely divided condition, the sample must be protected from oxidation unless immediately used, and for the same reason precautions must be exercised against oxidation during analysis.

This machine is identical in principle to that invented by Thomas Gare for powdering vulcanized rubber preparatory to reclaiming. United States patent 969,100 (1910).

A "PERMANENT SET" TESTING MACHINE.

Under the present methods of procedure of the Underwriters' Laboratories for physical testing of rubber insulation, a new factor has been introduced in obtaining the so-called "permanent set" on a stretched test piece. The insulation is required to be stretched from 2 to 5 inches for insulation 4/64 inch or under or



from 2 to 4 inches for insulation 5/64 inch or over, held at that mark for 2 minutes and then released. Two minutes after release the marks should not be more than 2½ inches apart.

A simple apparatus has been designed by M. M. Kahn, of the New York Insulated Wire Co., and in use in the laboratory of that company, especially to take care of the above mentioned test.

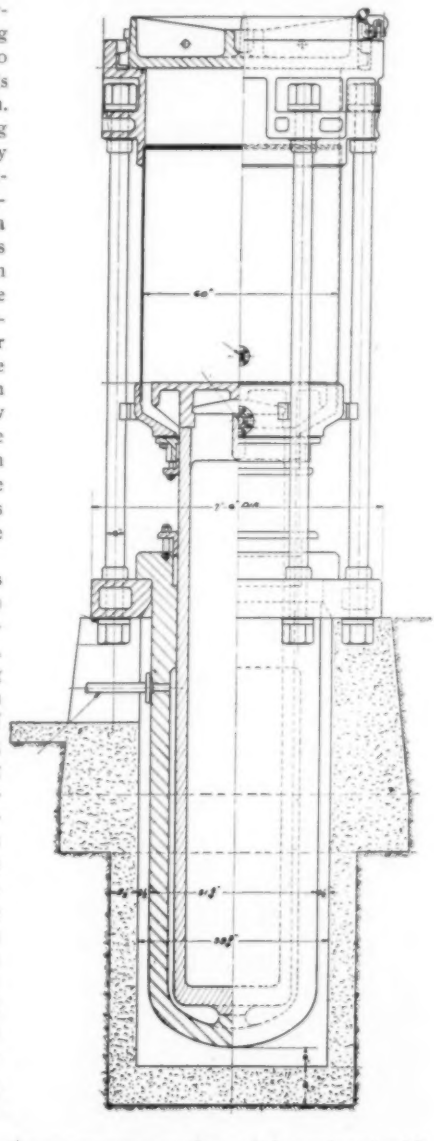
Referring to the illustration, *A* is a Eureka silk tester graduated in quarter pounds up to a maximum of 20 pounds; *B* is a heavy glass cover to protect the dial, and *C* is a 2-inch strip of leather, one end attached to the tester *A* and the other end to the clamp *D*. The clamps *D* and *E* are provided with two pins, one being fixed and the other working freely in the socket. *F* is another leather strip, one end of which is fastened to the clamp *E* and the other to the shaft. *H* is the hand crank, *I* the ratchet wheel and *K* the pawl that holds the tension wherever desired.

In making the test a piece of insulation about 8 inches in length has marks placed upon it, 2 inches apart. Each end is passed around, then under and through the clamp, so that when stretched the tension pulls the movable pin against the insulation and prevents it from slipping. The pawl is set on the ratchet wheel and the lever is rotated, stretching the test-piece until the marks are 5 inches apart. After the sample has remained under tension the required 2 minutes it is released by raising the pawl and taken out and the set noted. When permanent set has been obtained the test piece can be replaced in the clamps and stretched to the breaking point. For simple tests on elongation and rupture the pawl can be released.

The apparatus can also be used in testing any kind of strip rubber where permanent set, elongation and tensile strength are required.

ONE THOUSAND TON TRUCK TIRE PRESS.

There has been a constant demand for increased pressure on truck tire molds during vulcanization, which has resulted in the construction of the press illustrated herewith. Its weight is sixty-five tons. It has a thirty-six-inch diameter ram, and is designed for a hydraulic working pressure of two thousand pounds per square inch. The vulcanizing chamber is sixty inches in diameter and is adequate to take a stack of molds twelve feet in height. The height of the entire press over all is thirty-five feet, but when installed below the level of the curing room floor, only three feet of the press project above the floor.



This press is equipped with the Akron-Williams boltless, quick opening type head, which is lifted out of the way, leaving the vulcanizing chamber entirely unobstructed when molds are to be inserted or removed. The separate outside packing glands are provided for both steam and water, and an oiling ring lubricates the ram, cylinder and glands.

To provide for the enormous ram thrust it is equipped with six 6-inch stay bolts, and the vulcanizer shell itself is subject to steam pressure only, thus relieving the shell from all hydraulic pressure. This press provides efficient and economical means of vulcanizing truck tires under high pressure. [The Williams Foundry & Machine Co., Akron, Ohio.]

THE EDITOR'S BOOK TABLE.

RUBBER PRODUCING COMPANIES, 1915. MINCING LANE TEA and Rubber Share Brokers' Association, Ltd., London. [Board covers, 8vo, 547 pp. Price 3 shillings.]

THIS hand-book presents, in form convenient for ready reference, concise, authentic data concerning the financial condition and operation of 526 companies representing issued capital of £57,361,000, an increase of £5,884,000; though showing four companies less than were listed in the same hand-book for 1913. Plantation companies have studied economy of management with good effect and a large proportion of them should be making 100 per cent. profit at a selling price for rubber of 2 shillings per pound. Cost of production may be expected to drop to 9 pence per pound with well managed companies. At the outbreak of the war governmental assistance averted anything like a crisis and the financing of the industry soon became normal.

The book closes with a list of plantation company secretaries and addresses. It will be found very useful to investors and others seeking reliable information in regard to the planting industry in the Far East.

INDEX TO PATENTS, TECHNOLOGY AND BIBLIOGRAPHY OF China Wood Oil (Tung Oil). A compilation of everything that has been written about Elaeococca Oil (China Wood Oil), with translations, and names of authors and publications. Compiled and published by George H. Stevens and J. Warren Armitage. Two vols. of two parts each, comprising nearly 2,000 pages. [Quarto, paper covers, 136 pages.]

As the title above implies, this publication is simply an index, but it is an index of an unusual character, as it fills over 130 pages and contains over 40,000 references. The compilation on the subject of China wood oil—of which this publication is but the index—has engaged the energies of these two authors for a year and a half, and it contains matter taken from over 800 publications. More than half of the matter is taken from foreign sources and has never appeared before in English, being especially translated for this work. This compilation consists of careful transcripts, translations, photographs and blue prints, of every separate article that has ever been printed on this subject. These various items have been arranged on uniform sized sheets and bound together between handsome loose leaf covers into four large volumes, as a manuscript edition, and the contents are thoroughly covered by the 40,000 citations given in the index.

The rubber manufacturer will find quite a good many references to rubber and kindred substances. For instance, under "Rubber" there are 51 references; under "Rubber-like Products," 12; under "Rubber Resins," 40; under "Various Caoutchouc-like Materials, Mixtures and Substitutes," 15. There are 22 references to factice. Substitutes for rubber have 26 references, vulcanization, 19, and related subjects, 20.

The work, itself, consists of four large books. Only a few of these complete books have been made up at the start, as it is the intention of the authors to supply purchasers with pages on such subjects as they are interested in. Anyone looking through the index and discovering references to matter which he would like to get can find out the cost and other details by writing to either of the two compilers, George H. Stevens, 77 Orange avenue, Irvington, New Jersey, or J. Warren Armitage, 886 Lake street, Newark, New Jersey.

FIELD PRACTICE. AN INSPECTION MANUAL FOR PROPERTY Owners, Fire Departments and Inspection Offices. Covering Common Fire Hazards and their Safeguarding and Fire Protection and Upkeep. Published by the National Fire Protection Association, Boston, Massachusetts. [190 pages, leather bound. Price $1.50.]

As indicated by the title, this book covers the whole field of fire protection—the means of safeguarding or removing the causes which originate fires; the providing of means which may make it possible to confine fire to the space where it originates, and the necessary means of extinguishing fire. The whole subject is treated in detail. This manual will serve as a guide for property owners, as well as for municipalities, fire department inspection offices, and for factory superintendents.

DEPRECIATION IN THE RETAIL SHOE BUSINESS.

The Bureau of Business Research connected with the Graduate's School of Business Administration of Harvard University, has issued, since the foundation of that school a few years ago a number of bulletins on different phases of business administration. Bulletin No. 4, "Depreciation in the Retail Shoe Business," has just come from the press in the form of an octavo pamphlet of 32 pages. The object of this bulletin is to explain the treatment of inventories and depreciation on the profit and loss statement of the Harvard system of accounts for shoe retailers, and also to show how the profit and loss statement is derived from the set of double entry books as usually kept. Shoe retailers, including those who deal in rubber footwear, will find this pamphlet exceedingly helpful in showing them how best to charge off the natural depreciation of their stock. The bulletin is sold for 50 cents, and is printed by the Harvard University Press, Cambridge, Massachusetts.

MONETARY SYSTEMS OF LATIN-AMERICA.

The National City Bank of New York has issued a number of interesting publications relating to commercial matters in South America and intended primarily to show to the manufacturers and importers of the United States something of the field for their operations that is offered by the Latin-American countries. A pamphlet of 32 pages just issued by the National Bank and written by Joseph T. Cosby, manager of its foreign department, is entitled, "Latin-American Monetary Systems and Exchange Conditions," and in a concise way it gives the information covered by its title. Taking the various southern republics in alphabetical order, it describes the monetary system of each and the methods by which exchange is effected. This little publication must prove of value to all who wish to do business with our southern neighbors.

REGISTRATION OF TRADE MARKS IN LATIN AMERICA.

American manufacturers who plan to extend the sale of their trade-marked goods in Latin American countries should avail themselves of the information placed at their disposal by the Department of Commerce, Bureau of Foreign and Domestic Commerce, E. E. Pratt, chief. The Department has issued "Tariff Series No. 31," on "Registration of Trade Marks in Latin America."

FIRST ANNUAL REPORT OF THE INTERNATIONAL ASSOCIATION FOR RUBBER CULTIVATION IN THE NETHERLAND INDIES.

This association was projected in December, 1913, by various persons of Dutch and other nationality interested in the cultivation of rubber in the Netherland Indies, for the purpose of serving the general interests by uniting the different groups connected with this cultivation. The membership numbers 155, of which 61 are companies. The association is assured of the friendly co-operation of the planters' associations in the Netherlands Indies. It has rendered valuable assistance in the financing of many estates in the war crisis and following the war will doubtless enter an enlarged field of regular and productive work.

PRIZES FOR PLANS OF RUBBER ESTATE FACTORIES.

The council of the association has recently offered prizes for plans for complete rubber estate factories for the making of crêpe and smoked sheet. Both plans are to be adapted for a capacity, to begin with, of 100,000 kilos [220,460 pounds] of dry rubber per annum, which by three extensions can be increased to 250,000 kilos [551,156 pounds]. The first prize is 1,500 florins [$603] and the second 500 florins [$201]. Competition closes March 1, 1916, and designs are to be sent in to the office of the association, 13, Kneuterdyk, The Hague, or to its office at Medan, Deli. Particulars can be obtained from the association.

It comprises a summary of the laws and regulations governing the registration of trade marks in Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Salvador, Santo Domingo, Uruguay and Venezuela. Announcement is made that the Bureau is prepared to furnish information in answer to specific questions concerning such laws, and attention is called to the difference in the legal point of view as to the ownership of trade marks between the Latin American countries and the United States. The importance of registration is greater in the former countries than in the latter, in view of the possibilities for unfair registration under the trade-mark laws in effect in Latin American countries where registration is usually granted without investigation of the right to its use and once effected is final against all later comers.

A TENTATIVE LIST OF SOFT RUBBER DRUGGISTS' SUNDRIES.

THE importers of drug sundries and rubber goods have had reason on many occasions to protest against decisions made by the New York appraisers. Drug sundries are assessed at 15 per cent. duty while rubber goods carry 10 per cent. It is therefore quite important that the distinction between drug sundries and rubber goods be made as definite as possible. As a suggestion to the Classification Committee of the United States Customs, the Drug Sundries Division of the Rubber Club of America has prepared the following list of soft rubber druggists' sundries which has been approved by 17 manufacturers of this class of goods.

SOFT RUBBER DRUGGISTS' SUNDRIES.

Air Beds
Air Pillows & Mattresses
Applicators
Aprons (Surgeons', Sanitary)
Atomizer Bulb Sets
Baby Pacifiers
Bags (Breeder, Gonorrhea, Ear, Throat, Mastoid, Intra-Gastric, Face, Gas, Sterile Dressing, Ice, Pulitzer, Sponge, Blood-Pressure, etc.)
Bandages
Basins
Bath Sprays
Bed-Pans
Belts (Umbilical, Abdominal, Gum, Perforated Frictional Belts, etc.)
Bibs
Bougies
Breast Pumps
Breast Shields
Brushes (Complexion, Hand, Bath, Flesh, Tooth, etc.)
Bulbs (Atomizer, Camera, Syringe, Complexion, Dental, Breast Pump, etc.)
Caps (Operating Head Caps, Test Tube Caps, Ice Caps, etc.)
Catheters
Cautery or Pyrographic Bulb Outfits
Coils (Head, Abdominal)
Complexion Cups
Covers (Drainage, Gauze, Dilator, Segregator, Sanitary)
Crutch Tips
Cupping Cups
Cushions (Obstetrical, Operating, Chair, Hospital, Embalming, etc.)
Dam (Dental)
Diapers
Dilators
Empyema Tubes
Ether Bags
Face Masks
Finger Cots
Fittings for Nursing Bottles
Funnels (Soft Rubber)
Gloves (Autopsy, Household, Obstetrical, Surgeons', Veterinary, etc.)
Gum (Bandages)
Hospital Blankets
Ice Helmets
Invalid Cushions
Medicine Droppers (unless glass chief value)
Nasal Feeding Tubes
Nipple Shields
Nipples
Obsterical and Operating Cushions
Obstetrical Sleeves
Operating Caps and Pads
Pessaries
Rubber Corks and Chemist Stoppers
Sheeting
Spinal Ice Bags
Sponges (Rubber)
Sprinklers (Disinfecting, Flower)
Stethoscope Tubes
Stopples
Syringes (Bulb and Bag)
Teething Rings
Tourniquets
Tubes (Rectal, Colon, Stomach, etc.)
Tubing (Rubber)
Urinals
Water Bottles

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

RUBBER SAMPLES ALSO BARRED.

It will be seen from the following communication, sent July 19 to members of the trade by the secretary of the Rubber Club, that the British government does not sanction the sending of samples by American manufacturers direct to neutral European countries. Samples like shipments of goods must be sent via London.

To RUBBER MANUFACTURERS:

A number of inquiries have been addressed to this office asking whether non-merchantable samples of rubber goods could be shipped direct to neutral European countries by firms signatory to the British rubber guarantee without violating it.

As an answer to these questions, I would call your attention to the following letter written in London, July 5, by the acting secretary of the Rubber & Tin Exports Committee to the secretary of The Rubber Club of America, Inc.:

> Sir.—I am directed by the Rubber & Tin Exports Committee to acknowledge the receipt of your letter of the 19th ultimo, and to state that they do not see their way to exempting samples of rubber goods from the provisions of the Rubber Bonds and Guarantees.

From the above it is clear that the British government wishes samples of rubber goods treated in the same manner as the goods themselves, i. e., shipped via United Kingdom when sent to neutral European countries.

Very truly yours, H. S. VORHIS, Secretary.

THE GERMAN RUBBER PRESS AGAIN CRITICIZES THE AMERICAN RUBBER TRADE.

LATE in March the "Gummi-Zeitung," published at Berlin in the interests of the German rubber trade, criticized with considerable severity the American rubber trade for the agreement which it had entered into with the British government under which American manufacturers agreed not to supply the enemies of Great Britain with either crude rubber or rubber manufactured goods, if the British government would lift the embargo on shipments of rubber to American ports. In the May issue of THE INDIA RUBBER WORLD, by way of answer to this German criticism, there was an editorial statement of the rubber situation in this country and the necessity that existed for acceding to the terms of the British government in order to avoid a shortage of crude rubber that would very seriously have crippled the American industry. It was the belief of the editor that the statement adequately covered the ground; but the "Gummi-Zeitung" in a recent issue again reverts to the subject, and repeats its criticisms in the following language:

REPLY TO THE INDIA RUBBER WORLD'S EDITORIAL—"A GERMAN CRITICISM OF THE AMERICAN RUBBER TRADE."

Following our criticism of the American rubber industry, our American colleague, THE INDIA RUBBER WORLD, wrote as follows: (Here follows a translation of THE INDIA RUBBER WORLD'S May Editorial, entitled, "A German Criticism of the American Rubber Trade.")

In accordance with our principles we have allowed the other side to be heard. We would be glad to be in accord with our colleague but with all our good will we cannot. In the above we note an exhibition of weakness in the American industry that is not worthy of an influential body and a great nation, and which we are convinced could have been avoided. Certainly other means could have been found, particularly in view of the fact that many firms had important orders for delivery in Germany which had to be canceled. This is further confirmed by what we have just learned, namely, that the members of the firm of Salomon Brothers have been fined for violating neutrality, because they wanted to ship rubber to Germany—ostensibly because they had packed the rubber in cotton bales.

This only confirms what we said of America's subordination to England's wishes. This means that the American government, like the American rubber industry, has placed itself entirely in the service of Great Britain and her interests. They have surrendered their trade rights in favor of England. This is the greatest loss an industry could sustain and a loss against which its government should have protected it. Because we Germans would not submit to such things, they call us barbarians. But we are genuinely glad to bear this designation.

Annual Outing of the Rubber Club

WHEN the Rubber Club holds an outing it invariably brings together a couple of hundred members of the rubber trade who have abandoned themselves to a day of sociability, sports and care-free enjoyment. That was certainly the case on Wednesday, July 14, when the Vesper Country Club was the scene of this annual function. This club owns a beautiful wooded island in the Merrimac River, just above Lowell, Massachusetts, and here a fine club house has been erected, also a number of special buildings suitable for the various sports and avocations of the members of the club, while the grounds have been turned over to the attention of landscape architects and golf and tennis experts. The result is one of the finest club premises in New England.

Thither in the morning half a hundred or so more or less expert golfers hied themselves, to take part in a golf tournament—one of the regular features of all the outings of the Rubber Club—which lasted all day long, the score not being officially settled until nearly sundown.

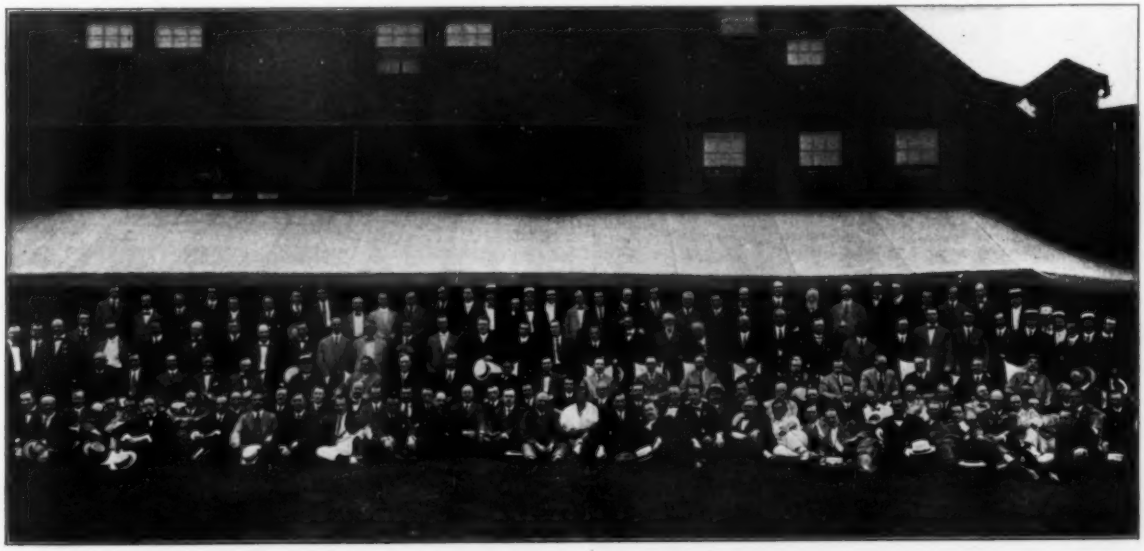
The non-golfers, however, waited until one o'clock, when they embarked on a special train from Boston. The ride occupied about an hour and a commodious baggage car was improvised for a buffet, to take the edge off the appetites of the excursionists, for whom a more substantial lunch was served upon their arrival at the club grounds.

In order to keep the members interested, tin "Kazoos" were distributed, so each could make his own music, the band program being reserved for afternoon and evening entertainment. A Kazoo octette was organized, which paraded the length of the train a few dozen times, the selections rendered including most everything from "Tipperary," "Marseillaise" and "Wacht am Rhein" (entirely neutral) to Sunday school hymns and "Dixie."

The train stopped on the bank of the river opposite the island. The connection therewith is a suspension bridge with footpath 4 feet wide. Suspension bridges of this kind proverbially wobble, but as a wobbler that particular footbridge should certainly take the prize. There was more motion to it than on a United Fruit steamer going South without cargo.

And at the end of the bridge was a turnstile. It was wide enough to let even the fattest rubber man through, but in its construction no provision had been made for the admission of a bass drum. It required the services of a bridge jumper, two structural steel climbers and a wader to get the bass drum to the island, but the job was finally accomplished without accident.

The march up to the club house ended, lunch number



MEMBERS AND GUESTS OF THE RUBBER CLUB AT THE ANNUAL OUTING.

two was partaken of, and then the contests for prizes in tennis, races and sports of various kinds were started. Others of the group ensconced themselves comfortably in piazza chairs and swapped stories, drank cooling beverages and variously enjoyed themselves.

It was hot work—golf and tennis, quoits and shot-put. And even the river sports were none too cooling, for the water was "fine and warm." Wallace G. Page had charge of this feature of the outing and in spite of an ugly blow in the chin, accidentally administered by a golf club earlier in the day, he managed the canoe-tilting contest and the swimming race very efficiently, L. J. Plumb and Allen T. Weeks being the winners of the former and Weeks of the latter. The tub race was not a success. There being no available embarking point on the island landing, the 5 tubs were taken by canoe across the river, where a seemingly auspicious spot had been chosen. The canoeists disembarked, the tubs were carried toward the intended starting point, when one after another found themselves sinking to the knees in soft mud. Nothing could stand on that quicksand, and the tubs—and the race—were abandoned.

Edwin L. Phipps had charge of the quoit contest, in which there were 32 contestants. By elimination this list was narrowed down to Miller, Quiri, Feinburg and Bennett. The play-off was between Miller and Feinburg, the latter winning.

The three-legged race was in charge of William L. Pitcher, who induced 6 couples to amble, canter or trot, with legs strapped together, over a rather long course. G. B. Ames and John S. Clapp won, by a method of perambulation which startled the spectators.

THE CANOE-TILTING CONTEST.

E. C. Clark interested a number of strong-armed men in the shot-putting contest, and F. M. Small secured the prize for throwing the twelve-pound sphere, his ability prompting the suggestion that he be sent across the water to project hand-grenades into the trenches.

THEY TOOK THE TUBS ACROSS THE RIVER IN A CANOE.

Mr. Hopkins had his hands full arranging the golf tournament. The official reports of the cards was not secured by THE INDIA RUBBER WORLD representative, but the prize winners were Wallace G. Page, best gross; C. W. Hamm, best net; C. W. Chandler, second best net. In clock golf Fred Howe carried off the honors and, incidentally, the handsome prize. In the driving contest Wallace G. Page again led.

MR. WEEKS WINNING THE SWIMMING RACE.

Clarence H. Low not only had charge of the whole afternoon's tennis matches, but also took a hand in them, to such good effect that he landed the first prize, E. S. Dane capturing second.

But the hardest job of all was that assigned to Lloyd Appleton — securing entrants to the "cock-fight." A horizontal bar about 8 inches in diameter was fastened at a height of 6 or 8 feet, and under it were placed soft mattresses. Two contestants faced each other, astride this bar, and whacked away with feather pillows until one or both lost balance and dropped to the padded area below. After much urging, some dozen or so fighters faced their opponents; then the winners fought, and again the fights narrowed down, until only Pitcher and Clark remained, and Pitcher pitched Clark off and then pitched after him, and was declared winner.

Then everybody was rounded up before the club house, with the result shown in the group picture presented herewith.

The dinner was worthy of the occasion. Tables accommodating a dozen or twenty were placed the whole length of front and side piazzas. Every man was supplied with an artistic hat or cap, which he was compelled to wear. There were more than 57 varieties, and the official photographer regrets that the night was too dark to allow for picture-taking.

The menu was unique. It was an idea of F. F. Schaffer and a contribution by the Goodyear's India Rubber Glove Manufacturing Co. for the occasion. It was noticed when the company was seated that there were no bills of fare, but soon there were distributed neat, plaid-covered boxes. On opening, each box was found to contain a handsome hot water bottle, about the size of a man's hand. Investigation showed that

the menu was engraved on the red rubber, together with the date and the name of the club. It was a bright idea, cleverly carried out, and certainly appreciated.

The menu read as follows:

THE RUBBER CLUB OF AMERICA, INC.

MENU.

Cocktail
Clam Broth
Steamed Clams
Olives Radishes
Broiled Live Lobster
Saratoga Chips

Cigars Cigarettes
Champagne

Grilled Half Spring Chicken
French Fried Potatoes
New Green Peas Green Corn

Frozen Pudding
Roquefort Cheese Toasted Saltines
Coffee

VESPER COUNTRY CLUB,
Lowell, Massachusetts,
July 14, 1915.

Rubber balloons of various colors, each lettered with the name of the club, were tossed and batted from table to table, until the too rough usage caused punctures and explosions.

The dinner was enlivened by music, the Cadet Band being responsible for the instrumental and the Lotus Quartet for the vocal selections, while many impromptu solos, duets, trios and choruses were the voluntary contributions of the diners.

As usual, the prizes were distributed during the dinner, and also there was an absence of speeches, prandial or post-prandial. Good fellowship reigned and the whole affair was strictly informal.

And when all had eaten and drunk their fill it was time to take the special train at the other end of the undulating bridge. Again the big helicon and the bass drum were carried around the turnstile. An hour later the company separated at the North Station in Boston.

Great credit must be given the members of the Outing Committee—P. E. Young, of the Acushnet Process Co.; Robert L. Rice, of the Hood Rubber Co., and F. H. Appleton, Jr., of F. H. Appleton & Son., Inc. Mr. Young had charge of the transportation, Mr. Rice of the dinner, and Mr. Appleton of the sports. The gentlemen in charge of the various features and contests, whose names are mentioned earlier in the report, are also entitled to praise and the thanks of the association for their good work.

CLUB HOUSE OF THE VESPER CLUB, WITH TENNIS COURTS IN FOREGROUND.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

UNITED STATES CONSUL REPORTS ON HOLLAND'S RUBBER TRADE.

United States Consul D. I. Murphy, stationed at Amsterdam, Holland, in his report of April 10, has the following to say of the rubber industry of that country:

"In the early part of 1914 demand for rubber, especially the cultivated product of the East Indian plantations, was keen.

"The following table shows the stock of rubber on hand January 1, 1914, the amount imported during the year, the extent of the sales, and the stocks unsold on December 31. The quantities are given in half kilos of 1.1 pounds each:

	Hevea.	Plantation *Ficus.*	*Castilloa.*	Ceara.	Forest *Ficus.*	Other forest.	Total.
	Half kilos.	Half kilos.	Half kilos.	Half kilos.	Half kilos.	Half kilos.	Half kilos.
Stock Jan. 1, 1914	88,448	8,090	744	1,090	6,165	16,665	121,202
Imports in 1914..	1,184,181	109,014	23,223	6,258	1,395	10,050	1,334,121
Total	1,272,629	117,104	23,967	7,348	7,560	26,715	1,455,323
Sold in 1914....	1,240,672	65,888	22,687	7,348	7,560	26,715	1,370,870
Stock Dec. 31, 1914	31,957	51,216	1,280	.....	.....	.....	84,453

"The 1913 import consisted of 1,039,500 half kilos, of which 839,500 were *Hevea*, 121,000 plantation *Ficus*, 23,000 *Castilloa*, 500 Ceara, 30,000 forest *Ficus*, and 21,000 various forest rubbers. From which it will appear that the 1914 import exceeded that of the year previous by 294,621 half kilos.

"At the first 1914 auction in January prime *Hevea* brought 1.57½ florins per half kilo ($0.63 per 1.1 pounds). Prices advanced to 1.76½ florins in April, falling to 1.47½ florins at the end of July. During the last five months of the year, prices fluctuated considerably.

"The pressing need for rubber by the contending powers soon made itself felt, brisk and incessant demand being evident. Unfortunately, however, the importation of rubber became practically impossible, cargoes consigned to Amsterdam being seized en route and unloaded in the ports of one of the warring nations. In the last part of the year the best price for prime *Hevea* was 2 florins per half kilo ($0.80 per 1.1 pounds). Private stocks were entirely disposed of, what rubber remained unsold December 31 being retained by the government. Two important factories in this consular district, one at Amsterdam and the other at Haarlem, manufacture rubber driving belts, tubing, railway buffers, plugs and linings, and recently have had pronounced success in making ebonite, or hardened rubber. The product of these concerns, made from the raw rubber of the East Indies, is largely exported to the Dutch colonies, Belgium, Great Britain and Africa."

AMERICAN RUBRER GOODS IN DOMINICAN REPUBLIC.

The total imports of rubber goods into the Dominican Republic amounted in 1914 to $27,091, of which $22,441, or 82 per cent., was furnished by the United States. During the previous year imports from the United States amounted to $27,309, or over 87 per cent. of the total imports of rubber goods, which were valued at $31,032.

The Goodyear Tire & Rubber Co., Akron, Ohio, is issuing to users of Goodyear tires two very useful slide rule scales. One is designated as the "Goodyear Inflation and Load Scale," and the other the "Goodyear Calculator for Pneumatic Tires."

The first instrument shows the best average load, with its corresponding inflation pressure, for any given tire section. The second instrument has a double set of scales. One set will enable the tire user to determine the possibilities or durability of the tires in use and the effect of an increase of size; the other set of scales enables one to determine per cent. changes of cushioning qualities of a tire corresponding with the pressure necessary to produce it, and also the effect of increase in size of tire section on cushioning.

THE UNITED STATES RUBBER CO.'S DIVIDENDS.

AT a meeting of the board of directors of the United States Rubber Co., held July 1, a quarterly dividend of 2 per cent. was declared on the first preferred stock and a quarterly dividend of 1½ per cent. on the second preferred stock, payable July 31 to stockholders of record at 3 P. M., July 15.

There had been considerable speculation in financial circles as to what action the company would take regarding dividends on its common stock. This matter was taken up at that meeting by President Samuel P. Colt, who made the following suggestion:

"I have thought it might be helpful to outline to the board of directors the following points bearing upon the payment of dividends upon the stocks of our company at the present time:

"1. I assume there will be no question as to the payment of the regular dividends upon the preferred stocks and that the only doubt in the minds of the directors will be as to the advisability of paying a dividend at this time upon the common stock.

"2. At the meeting of our board immediately following the outbreak of the European war, it was quite evident that a number of our directors were averse to the then payment of the common stock dividend and that the then hope of an early termination of the war stress of financial conditions then existing and motives of patriotism influenced their action in favor of a dividend. The feeling of conservatism on the part of the board then begun has continued to increase until it would seem that a considerable number of directors are now opposed to the present declaration of a common stock dividend.

"3. In 1901, when your present president was first elected, the company was not paying dividends on either the preferred or common stocks. In 1904 dividends were resumed on the preferred stock and have since been continued regularly. In 1911, after considerable pressure on the part of common stockholders, dividends at the rate of 4 per cent. per annum were begun upon the common stock and continued at that rate until April, 1913, when the rate was increased to 6 per cent. per annum. This increase was made largely in order to effect the purchase of the Rubber Regenerating Co., which company was paid for by the issue of $6,000,000 of the common stock of the United States Rubber Co.

"4. In the last annual report of the president to the stockholders, dated March 4, 1915, appears the following:

'THE OUTLOOK.'

> 'While at the moment there is nothing discouraging in relation to our business, your president feels that the year 1915 is one of uncertainty; and it may be considered good fortune if we are able to maintain or to increase our volume of sales and profits as compared with last year. When the uncertainties caused by the war shall have ceased, when we shall receive a substantial part of our crude rubber from our Sumatra plantations, and when we shall have realized our anticipations from our development and operating departments, we fully expect to enjoy prosperity greater than we have heretofore known.'

"That report further shows that the surplus profits of the company for the year 1914 were $721,950.79 over dividends paid on the preferred and common stocks during the year. It further shows that $4,850,000 was expended during the year in fixed properties, including the rubber plantations in Sumatra, which sum, less surplus of earnings, was taken from the quick capital of our company.

"5. The net earnings of the company so far this year are substantially the same as those of last year, and as a rule the earnings of the latter half of the year exceed those of the first half. The unexpected prolongation and extension of the European war have presented uncertainties which it may be urged make it now especially desirable to maintain an unusually strong financial position. The pendency of the war makes it prudent to carry a larger stock of crude rubber than in normal times, involving the use of a larger amount of quick capital.

"6. The outstanding common stock being $36,000,000, 6 per cent. dividends thereon amount to $2,160,000 per annum. It is undoubtedly desirable that current bank loans should be reduced in volume. The lower price of crude rubber, resulting from its cultivation in the East, opens up new lines of manufacture, in the development of which capital is specially desirable. Should the directors determine to suspend common stock dividends for a time, the company will undoubtedly be greatly strengthened thereby and it is not unreasonable to believe that such action in the end will prove more advantageous to our common stockholders and profit sharers than the present distribution of cash.

"7. While competition in the rubber manufacturing business promises to be keen in the future, your president looks to see the United States Rubber Co. continue a prosperous business, and with the coming into bearing of our rubber plantations in Sumatra, from which we will in the not distant future receive at its production cost a substantial amount of our crude rubber requirements, we may reasonably look for greater profits than heretofore realized."

The board of directors on hearing the president's suggestion as to the dividend on the common stock took the following action:

"The directors of the United States Rubber Co., having heard the suggestions of the president in regard to the payment of a dividend on the common stock at this time, and having fully considered the question, are unanimously of the opinion that the excess of earnings over dividend requirements is too small to warrant the payment of this dividend at this time in view of the amount of the company's floating indebtedness, the additional capital required to develop new lines of business, and the uncertain conditions arising from the European war. In their view a sound and conservative business policy requires that the money necessary to pay a dividend on the common stock should at this time be used to reduce the floating debt and to increase the working capital; and they believe that this action will strengthen the position of the company, and, in the end increase the value of both the common and preferred stocks."

TRADE NEWS NOTES.

The directors of the New Jersey Zinc Co. voted unanimously on July 7 to increase the capital of the company from $10,000,000 to $35,000,000 by declaring a 250 per cent. stock dividend. The war has developed such an increased demand for zinc that the zinc mines are being worked overtime to meet it.

The Montreal division of the Canadian Consolidated Rubber Co., Limited, has recently filled orders for suction hose, pneumatic tool hose and hip and knee boots for use by the C. P. R. Overseas Engineering force in France. This force is composed of construction engineers and workmen, who will assist in bridge building, road making, etc., in the war area.

The Rubber & Celluloid Harness Trimming Co., which controls the Rubberset Co., of Newark, New Jersey, is suing the F. W. Devoe & C. T. Raynolds Co., of New York, for alleged unfair competition in the sale of brushes. The action involves the use of the terms "rubberset" and "set in rubber."

The Goodyear Tire & Rubber Co., Akron, Ohio, has inaugurated a stock system for dealers, enabling them to quickly determine what tires are in stock. The system employs tags in five colors for no-rim-cut tires, quick detachable clincher, regular clincher, tubes and miscellaneous. Each tag has an attached coupon which, after being properly marked, is torn off and kept for a desk record, while the stub is fastened to the tire in the stock room. Blank division cards are also provided for use by the dealer in making his own index for this system.

In the suit for infringement under patent No. 799,662, September 19, 1905, brought by the Allen Auto Specialties Co., New York, against E. G. Baker, in the United States District Court for the Southern District of New York, for offering for sale and handling the Gilbert tire case embodying the water-shed flap, Judge Hand has issued a decree in favor of the Allen company, enjoining Baker from selling this Gilbert type of cover.

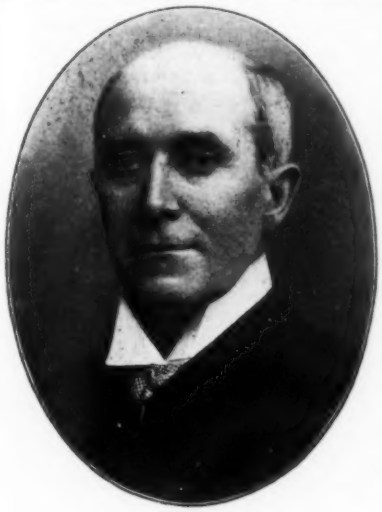
The St. Mungo Manufacturing Co., of Newark, New Jersey, which makes the "Colonel" golf ball, has opened offices in the North American Building in Chicago, and in the Lachman Building, in San Francisco.

The Standard Underground Cable Co., of Pittsburgh, Pennsylvania, has issued a condensed catalog of its ignition, lighting and starting cables for automobiles, motor boats and motorcycles. Twenty different types are illustrated and described.

The Obituary Record.

WILLIAM M. IVINS.

WILLIAM MILLS IVINS, formerly president of the General Rubber Co. but more widely known as a brilliant member of the bar, and a conspicuous figure in New York politics, died at his home, 145 West Fifty-eighth street, New York, July 23, from acute Bright's disease resulting from the exhaustion which followed the long strain of the Barnes libel suit against Col. Roosevelt, in which Mr. Ivins was the leading counsel for the plaintiff.



WILLIAM M. IVINS.

Mr. Ivins was born in Freehold, New Jersey, in 1851, but lived practically all his life in Brooklyn. He graduated from the Adelphi Academy in that city and studied law at Columbia Law School, from which he took his degree in 1873. Three years later, when only 25 years of age, he showed his mettle by leading a successful attack against the political "boss" of his home city. He displayed at that time such remarkable skill in exposing municipal abuses that he was called upon many times in later life to assist in effecting state and city government reforms.

In 1881 he became the private secretary of William R. Grace, then Mayor of New York, and in this way formed an association which later led him into prominence in the rubber field. When Mr. Grace was re-elected Mayor, in '84, he appointed Mr. Ivins City Chamberlain, a position which he held for four years with marked distinction. In the meantime he had become associated with Mr. Grace in various South American matters, becoming in this way interested in the rubber industry. So well known did he become in the southern continent that in 1892, when Brazil and Argentina became involved in a dispute over boundary lines, Mr. Ivins was asked by the Brazilian government to represent its interests, which he did with great success. When the Rubber Goods Manufacturing Co. was formed, in 1899, he assisted actively in its organization and during its earlier years was one of its directors. And when the General Rubber Co. was formed, in 1904, for the purpose of establishing a wide commercial system for supplying the United States Rubber Co. with its imports of crude rubber, he became president of the company. In November of that year he was one of the party taken by Commodore Benedict on the steam yacht "Virginia" for a three months' cruise up the Amazon as far as Manaos—undertaken chiefly for the purpose of studying the crude rubber situation.

In the fall of 1905 the Republicans of New York City made Mr. Ivins their candidate for the mayoralty. It was a three-cornered contest in which his two rivals were William R. Hearst and George B. McClellan. While Mr. Ivins did not succeed in winning the mayoralty, he succeeded in making that campaign one of the liveliest and most interesting municipal campaigns on record. In May of the following year—1906—he resigned as president of the General Rubber Co., owing to pressure of his legal work and other interests, and after that time took no active part in the rubber industry, although he planned to write an exhaustive work embracing the whole realm of rubber, a subject with which he had made himself widely familiar. The many demands on his time, however, made it impossible for him to carry out this project.

It would be impossible in the brief space available on this page to recount the commercial enterprises, official investigations and celebrated legal controversies in which Mr. Ivins took part. The last notable law suit in which he was engaged, referred to above—in which he represented Mr. Barnes against Col. Roosevelt—is too recent a matter of political history to need any extended reference. The tremendous volume of work which he did in connection with the suit, and the great energy that he threw into it, undoubtedly brought on the general physical collapse which terminated fatally.

Mr. Ivins was a man of extraordinary intellectuality, with a great diversity of gifts. He took a keen enjoyment in mastering languages, and spoke five or six with easy fluency. He was much devoted, also, to the science of botany, and was an enthusiastic collector of objects of historic interest. He was a man of marked individuality and left a notable record as a lawyer, orator, scholar and business administrator.

R. H. LOCK.

Dr. Robert Heath Lock, author of "Rubber and Rubber Planting," editor of the "Tropical Agriculturist," and formerly assistant director of the Botanical Gardens, Ceylon, died suddenly, June 26, at Eastbourne, England. Dr. Lock was 36 years of age. He was born at Eton College, where his father, Rev. J. B. Lock, was assistant master, and was educated at Cambridge University. In addition to his literary work he acted as curator of Cambridge University Herbarium for 3 years, and conducted for 4 years continuous experiments in rubber tapping. Dr. Lock, in "Rubber and Rubber Planting"—reviewed in these columns February, 1914—combined a treatise on the science of rubber planting with general information in such a way as to make the book interesting to the general reader as well as to the rubber expert. By his death tropical agriculture is deprived of the services of one specially fitted to advance its interest.

JOHN N. WILLIAMS.

John Newton Williams, connected for over 40 years with the Boston Rubber Shoe Co., and the father of Elisha S. Williams, president of the Rubber Goods Manufacturing Co., died from neuralgia of the heart July 2 at his summer home in Falmouth, Maine. Mr. Williams was born in Woodstock, Connecticut, March 31, 1849. He was a nephew of Mrs. Elisha S. Converse, and after finishing his course at the local school he joined the forces of the Boston Rubber Shoe Co., first being connected with its store in Boston and being transferred a few years later to the factory at Malden. There he had charge of the shipping department for nearly 35 years, retiring eight years ago.

During his employment at the factory in Malden he made his home in that city, but soon after his retirement moved to Brookline, Massachusetts. He was married in December, 1870, to Miss Caroline Bickford, who survives him. Besides Elisha S. Williams, there are three other surviving children, Frank C. Williams of Kansas City, Mrs. William D. Locherty of Malden and Mrs. S. C. W. Simpson of Brookline.

WILLIAM H. SMITH.

William H. Smith, who for twenty years was connected with the Manhattan Rubber Manufacturing Co., of Passaic, New Jersey, died June 30, after a long illness, at his home in that city, at the age of 66 years. He joined the Manhattan company in October, 1894, and had charge of its calender room until he was retired on a pension in October, 1913. His wife survives him.

JOHN L. MOTHERSHEAD.

John Leland Mothershead, for many years associated with The Grasselli Chemical Co., died suddenly at his home in Cleveland, Ohio, July 16.

Mr. Mothershead came from a family of Kentucky pioneers. He early moved to Indianapolis, where he was prominent in business and politics. Previous to his connection with The Grasselli Chemical Co., he was engaged in the manufacture of Silicate of Soda at Fortville, Indiana. Mr. Mothershead was well known throughout the chemical trade. He was a Knight Templar and a Thirty-second Degree Mason. He is survived by his wife, a daughter and two sons. The interment took place at Indianapolis.

JAMES MAC QUAID.

James MacQuaid, for many years treasurer of the National Conduit & Cable Co., of New York, died of heart disease, July 10, at his home in Twickenham, London, after an illness of several months. Mr. MacQuaid, with two partners, founded the Conduit company over a quarter of a century ago and he was very active in its affairs until his retirement ten years ago. Since that time he has made his home, for the most part, in England. He purchased the historic place at Twickenham known as "Pope's Villa" from the fact that it was in this house that Alexander Pope wrote the "Essay on Man" and other famous poems nearly 200 years ago.

ORIGIN OF RUBBER FOAM.

THE origin of rubber foam or rubber froth, as it is sometimes called, has been much discussed and it may be interesting to state a few facts concerning this discovery.

Rubber foam was first patented in Germany, on August 10, 1910, by Fritz Pfleumer, an Austrian engineer residing in Dresden, Saxony. A United States patent (No. 1,038,950) was granted to Mr. Pfleumer for his invention of rubber foam on September 17, 1912, and reissued (No. 13,667) December 30, 1913. Practically all the properties of rubber foam known today were enumerated in these letters patent.

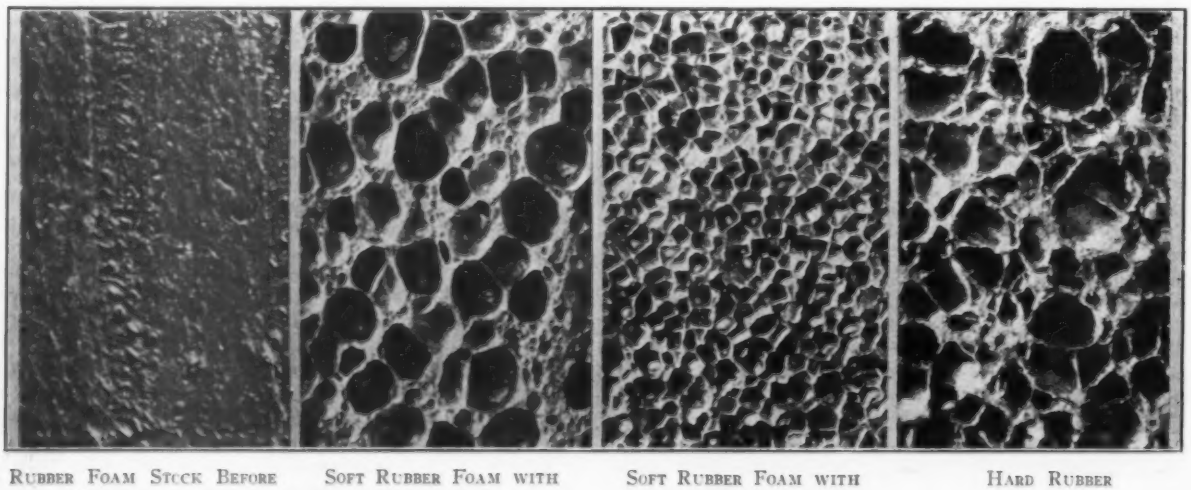
The manufacture of rubber foam is based upon the observation that rubber as well as gutta percha and balata are not homogeneous or impenetrable substances, but represent a microscopic reticular structure into which gas can penetrate and remain under certain conditions. Rubber foam can be produced either in the form of soft rubber or in the form of hard rubber.

To make soft rubber foam, rubber is subjected in an autoclave to the high pressure (80 to 300 atmospheres) of an optional gas and is vulcanized. Under the high pressure the gas penetrates the rubber so that when vulcanization is sufficient and the gas pressure removed the rubber thus treated swells into a foam-like mass the volume of which is from 13 to 18 times that of the original rubber before treatment. This foam-like mass is made up of a multitude of closed cells, each of which contains, under pressure, a portion of the gas that was forced into the rubber during the vulcanization. The size of these cells and the pressure of the gas they contain can be varied indefinitely by manipulations of the manufacturing process. For making hard rubber foam the process is continued by placing the soft rubber foam in iron retorts and subjecting it to heat and pressure, continuing the vulcanization until the desired degree of hardness is obtained. The shape and conformation may also be equally varied.

It is very light (about 100 pounds per cubic yard of volume), is both gas and water-proof and affected only by strong acids. The cost of production varies with the price of crude rubber, and is rather higher than the final cost of good soft or hard rubber. It must, however, be borne in mind that 1 pound of rubber foam has the same volume as 18 pounds of solid rubber.

A variety of practical applications is claimed for rubber foam due to its bulk and cellular structure. The list includes its use as a substitute for cork in life belts; filling for pneumatic tires and playing balls, imparting resiliency regardless of punctures; insulation of heat and cold in clothing for autoists and aviators and in walls of refrigerators; also for upholstery and other cushioning purposes.

While not affected by acids generally, rubber foam will dissolve in ammonia, which can be used to soften hard foam to facilitate working it. When the ammonia is evaporated hard foam regains its original hardness. It is said to be susceptible of fireproofing and is soon to be produced commercially at the rubber works in Elkhart, Indiana.



RUBBER FOAM STOCK BEFORE VULCANIZATION. SOFT RUBBER FOAM WITH LARGE CELLS. SOFT RUBBER FOAM WITH SMALL CELLS. HARD RUBBER FOAM.

Annual Meeting, American Society for Testing Materials.

THE annual meeting of the American Society for Testing Materials was held at Atlantic City from June 22 to 26, with a registered attendance of over 500 engineers and chemists representing the industries of rubber, metals, ceramics, coaltar, paints, fuels, lubricants and textiles. One of the noteworthy features of this meeting was the increasing interest shown in the so-called organic industries and the materials produced wholly or in part from organic products. At the first meetings of the society, held fifteen years ago, little or no mention was made of such subjects as coaltar products, rubber, lubricants and textiles, while at the meeting just closed fully one-third of the delegates were directly interested in a discussion of these topics, either as producers or as consumers.

Among the rubber interests represented in the society are Gutta Percha & Rubber, Limited, and the Dunlop Tire & Rubber Co., Limited, both of Toronto, Canada; The B. F. Goodrich Co., the Manhattan Rubber Manufacturing Co., the Hodgman Rubber Co., and the Goodyear Tire & Rubber Co.

The following rubber chemists are also members of the society: J. M. Bierer, of the Boston Woven Hose & Rubber Co.; Roscoe M. Gage of the Fisk Rubber Co., and Frederic Dannerth, consulting chemist, who represents the rubber goods manufacturing interests in a general way.

Among the consumers of rubber goods represented in the society are a number of the leading railroads of the country, including the Pennsylvania; New York Central; Delaware, Lackawanna & Western; New York, New Haven & Hartford; Northern Pacific; Union Pacific; Chicago, Burlington & Quincy; the Reading and Atchison.

Unfortunately for the manufacturers of mechanical rubber goods, they have a very small representation in the sub-committees in charge of preparing specifications. As there are at present only a few manufacturers enrolled as members of the society, the framing of specifications is done largely by the consumers, the railway interests.

Committee D-11 on Standard Specifications for Rubber Products (E. A. Barrier, chairman) prepared for the society a specification for Cotton Rubber-lined Fire Hose (described below), and another for Rubber Covered Wire. A specification for rubber belting for power transmission is being prepared by the Sub-committee on Belting and a specification for Air-Brake Hose is being prepared by another sub-committee in conjunction with the committee of the Master Car Builders' Association.

At the meeting just held in Atlantic City, two new sub-committees of the Rubber Committee were organized, one on Standard Methods of Testing and another on Standard Definitions and Nomenclature of Crude Rubber Varieties, of which Frederic Dannerth is chairman. The chairman of the other sub-committees are as follows: Air Hose, E. B. Tilt of the Canadian Pacific Railroad; Belting, W. E. Campbell, chief chemist of Gutta Percha & Rubber, Limited, Toronto; Cold Water Hose, E. A. Barrier of the Factory Mutual Laboratories; Insulated Wire, C. D. Young of the Pennsylvania Railroad; Packing, E. S. Land of the United States Bureau of Construction and Repair; Steam Hose, J. B. Young of the Reading Railroad.

At the general meeting of the society a resolution was offered to the following effect: "No specification shall contain any discrimination between two or more materials unless such specification contains a method of distinguishing these materials."

In explanation of this resolution it was stated that the use of such terms as Pará Rubber, Plantation Rubber, *Hevea* Rubber and the like was undesirable, as it was impossible to tell the source of a rubber after it had been made up into a finished product. It was contended that it was more important that the product should comply with certain physical or chemical tests. In view of this it would be thrusting too much responsibility on the manufacturer to compel him to put a certain botanical variety of rubber in his goods.

Another matter of special interest for rubber goods manufacturers was the organization of a Committee on Textile Fabrics, with W. D. Hartshorne, of Methuen, Massachusetts, as chairman, and D. E. Douty of the New York Conditioning Laboratory, as secretary. The sub-committee on automobile tire fabrics has already devised a method for testing this material, and a sub-committee on duck for belting and hose has been appointed. In view of the fact that there are at this date no officially recognized methods for testing textile cotton fabrics, rubber goods manufacturers will look forward with a great deal of interest to the work of these sub-committees. The work will consist, first, in devising standard methods of testing, and second, in preparing standard specifications for duck for tires, hose and belting.

TESTING RUBBER IN RUBBER-LINED HOSE.

PROPOSED standard methods of test for rubber in rubber-lined hose recommended by Committee D-11 of the American Society for Testing Materials, have been referred to the society for adoption by letter ballot.

They specify the usual precautions regarding sampling and preparation of reagents for analysis, and give in detail the methods for acetone extraction, free sulphur, alcoholic-potash extract, total sulphur and ash. Rubber is determined by difference between 100 and the sum of the total sulphur and ash expressed as percentages figured on the total compound. In case the alcoholic-potash extract is over 2 per cent. of the rubber as first calculated, this excess is also subtracted from the rubber. The organic-acetone extract is obtained by taking the difference between the total acetone extract and the free sulphur. The organic-acetone extract, free sulphur, total sulphur and alcoholic-potash extract are figured on the amount of rubber, found as above.

For physical testing 3 test pieces are cut, transversely of the hose, and tested between 65 and 90 degrees Fahrenheit. The test pieces are cut by die of shape and dimensions shown in Fig. 1. Test pieces must be buffed to remove adhering cement coating before the test, using for this purpose a power grinder.

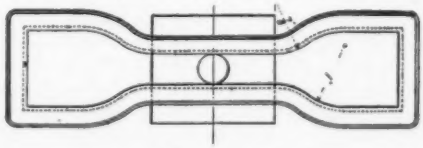


FIG. 1. DIE.

Tensile strength tests are to be made on apparatus conforming in general design to the "Schopper" machine. The grips must tighten automatically and exert a uniform pressure the full width of the test piece proportionate to the applied tension, jaws to separate at rate of 20 inches per minute. A spring micrometer gage, accurate to within 0.001 inch and having a circular foot 0.4-inch in diameter must be used for measuring. Elongation is to be measured on 2-inch marks placed on sample before test, the marks to be followed under test with a rule reading by 1/16 inches. Set is to be determined on an unstretched piece. Marks 2 inches apart are held stretched to a specified distance for 10 minutes, then released, and the set measured after rest of 10 minutes. Tensile tests are repeated if break occurs outside the gage marks on test piece.

Hydraulic pressure test of hose for bursting or proof is specified as follows:

The hose shall be stretched on a plane surface in a straight line and connected with the water line or pump and filled with water, venting all the air. The air-cock is then closed and pressure of 10 pounds per square inch applied. The test shall then begin by taking original measurements. Pressures are measured by a standardized gage.

The increase of pressure shall be made at a rate of 300 pounds per minute. While making the elongation and twist measurements the hose shall be held at specified pressure for not more than two minutes. In the bursting test, in the curved position the apparatus shown in Fig. 2 shall be used. The kinked test shall be made on 3-foot samples with the ends tied together and

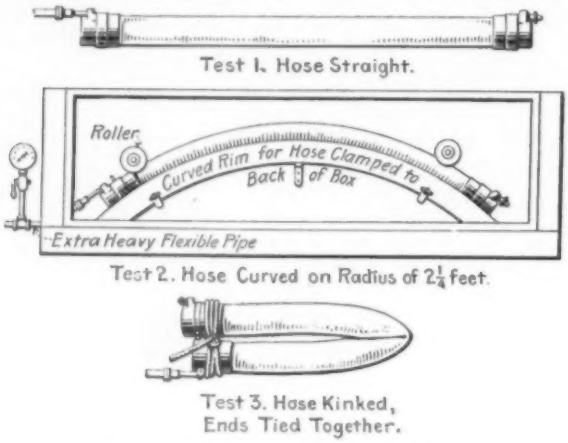

Test 1. Hose Straight.
Roller
Curved Rim for Hose Clamped to Back of Box
Extra Heavy Flexible Pipe
Test 2. Hose Curved on Radius of 2¼ feet.
Test 3. Hose Kinked, Ends Tied Together.

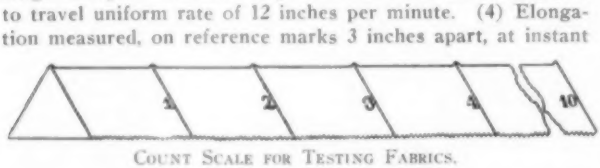
FIG. 2. APPARATUS FOR PRESSURE TEST.

the couplings touching with a sharp kink in the middle of the hose; or if made on a 50-foot sample the hose shall be tied together at a point 18 inches from where the kink occurs.

TESTING TIRE FABRICS.

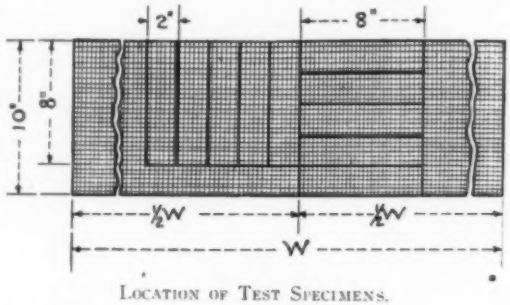
AT the recent meeting the Committee on Standard Tests and Specifications for Textile Materials reported tentative methods. This report was amended and accepted for publication for one year in the Year Book of the Society, subject to further action a year hence.

In outline the methods relate to the following matters: (1) Sampling a 10-inch swatch from either end. (2) Test specimens to be cut 8 inches long by 12 inches wide, raveled each side to required width, using a count scale (see figure). (3) Test samples to be oven dried (221 degs. to 230 degs. Fahrenheit) to constant weight; the breaking stress to be obtained within 30 seconds from removal from oven; the length of specimen between jaws to be 3 inches, moving jaw to travel uniform rate of 12 inches per minute. (4) Elongation measured, on reference marks 3 inches apart, at instant



COUNT SCALE FOR TESTING FABRICS.

of breakage. (5) Weight per square yard shall be based upon the dimensions of a complete roll expressed as dry weight, or standard weight. The latter is the dry weight increased by a standard moisture allowance of 8.5 per cent. (6) Moisture test samples are taken from both ends of roll while dimensions and net weight of roll are determined quickly and accurately. (7) Samples for moisture, weighing at least 3.5 ounces, are received and weighed in air-tight container (see (3) for conditions). (8) The dry weight of the roll equals the net weight of roll minus that weight multiplied by the percentage of moisture, by test, divided by 100. (9) The width of roll shall be determined as the average at 5 places uniformly distributed along length of roll. (10)



LOCATION OF TEST SPECIMENS.

Length of roll shall be determined by registered yardage over a measuring drum of known circumference. Uniform tension, suggested for this measurement, to be 2.5 times the weight of 5 running yards of the fabric.

STORAGE BATTERY TRUCKS FOR FACTORIES.

The aim of the factory manager is to eliminate all lost motion, thus increasing the output and decreasing cost. In a great many industrial plants half-finished and finished product must be transferred from one department to another and this work is done largely by means of hand trucks handled by a crew of men.

Examination of the internal transportation facilities of a plant will often disclose the lack of economy in the elevator service—

sometimes it is badly congested and at other times lying idle. As trucks with storage batteries will take easily a 15 or 20 per cent. gradient on inclined planes between floors, they are advised, thus saving delay, interest, depreciation and operating expense of elevator machinery.

In all the plants where these conditions prevail, storage battery trucks pay a handsome annual return on the money invested. The illustration shows the latest type of rubber shod truck. [Edison Storage Battery Co., Orange, New Jersey.]

RUBBER EMBARGOES.

The Union of South Africa has recently placed an embargo on exportations to all destinations other than the United Kingdom, British Possessions and Protectorates, of rubber (including crude, waste and reclaimed, rubber solutions, solutions containing rubber, jellies containing rubber and any other preparation containing rubber) and goods made wholly or in part of rubber, including tires.

The Governments of the Federated Malay States and British Honduras, the Canadian Customs Department and the Commonwealth of Australia have all announced similar embargoes.

News of the American Rubber Trade.

THE HODGMAN COMPANY'S NEW OFFICE BUILDING.

THE new four-story reinforced concrete office building which the Hodgman Rubber Co. is erecting at Tuckahoe, New York, is well under way, and it is expected will be ready for occupancy by December first. It is the purpose of this company to move its main office to Tuckahoe about the first of next year, so that all departments will be under one roof, but it is the intention to retain a New York office and sales room for the convenience of the trade.

THE U. S. RUBBER RECLAIMING CO. INCREASES FACILITIES.

The U. S. Rubber Reclaiming Co. has purchased a large tract of land adjoining its present property at Buffalo to provide for an increase of present warehouse facilities. The company proposes at an early date to erect storehouses with a capacity of 10,000 tons of scrap rubber.

This company will also take over and operate the plant of the Derby Rubber Co., at Shelton, Connecticut, on August 1. The large and increasing demand for reclaimed rubber suitable for insulated wire has necessitated this increase of facilities.

THE KING RUBBER CO.

In spite of the disastrous fire that occurred at the works of the King Rubber Co., Hyde Park, Boston, June 4, the company was manufacturing goods again June 20. The report that several gasolene tanks exploded in the works at the time of the fire was incorrect. There were no explosions whatever. The company intends to erect a new factory building which will be ready for use early in September.

RUBBER TRADE INQUIRIES.

[108] A large foreign rubber manufacturing concern which uses regularly up to 30 tons of carbonate of magnesia (basic precipitate) monthly, has requested through The India Rubber World names of American dealers in a position to supply this material in quantities.

[109] An inquiry has been received at this office for names of manufacturers of rubber jokes, especially hatchets and razors.

[110] Another inquirer desires the names of manufacturers of molds for turning out rubber hatchets, daggers, razors and tacks.

[111] A prominent European rubber manufacturing firm wishes quotations on various chemicals and compounding ingredients, including benzol, lampblack, litharge, lithopone, magnesia (carbonate and calcined), naphtha, resin oil, sulphur chloride and flowers, zinc oxide and sulphide and sulphuret of antimony, crimson and golden.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in England desires communication with manufacturers and exporters of vulcanite fittings for douches and syringes. Report No. 17,590.

A merchant in Spain wishes to receive offers on rubber bands for covering copper wire, similar to samples which may be examined at the Bureau of Foreign and Domestic Commerce at Washington or its branches.

Sealed proposals will be received at the office of the Light-house Inspector, Buffalo, New York, for approximately 6,900 feet of submarine electric cable. Schedule No. 2503.

A firm in Argentina desires to receive quotations and full information relative to rubber heels, etc. Report No. 17,637.

An American consular officer in Brazil reports the name and address of a firm which desires to sell about 70 tons of gray Manicoba rubber. References are given. Report No. 17,464.

ANOTHER VIOLATION OF THE RUBBER AGREEMENT.

Late in July six crates containing fifty auto tires were shipped by one of the smaller tire manufacturers to Amsterdam, Holland, consigned to the Netherlands Oversea Trust Co. The British government at once blacklisted the tire manufacturer and his permit to buy plantation rubber was cancelled.

UNITED STATES TIRE CO. REPORT.

The United States Tire Co., incorporated under the laws of New York, has filed with the Massachusetts Secretary of State a statement of its financial condition as of March 1, 1915. The following is a comparison of this report with that of the previous year:

Assets.	1915.	1914.
Real estate, machinery and equipment..	$387,475	.....
Real estate and investments.....	.....	$91,953
Merchandise, etc.	3,415,522	6,192,380
Manufactured merchandise, material and stock in process.....	2,651,798	5,475,129
Trade marks, patent rights and miscellaneous assets	566,106	.....
Total	$7,020,902	$11,759,462
Liabilities.		
Capital stock	$500,000	$500,000
Accounts payable	6,417,162	11,158,978
Surplus	103,740	100,484
Total	$7,020,902	$11,759,462

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on July 24 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Asked.
Ajax-Grieb Rubber Co., common	300	..
Ajax-Grieb Rubber Co., preferred	100	..
Firestone Tire & Rubber Co., common	506	512
Firestone Tire & Rubber Co., preferred	109	111
The B. F. Goodrich Co., common	50	51
The B. F. Goodrich Co., preferred	104½	106
Goodyear Tire & Rubber Co., common	269	272
Goodyear Tire & Rubber Co., preferred	105	106½
Kelly-Springfield Tire Co., common	165	168
Kelly-Springfield Tire Co., 1st preferred	86	87
Kelly-Springfield Tire Co., 2d preferred	160	170
Miller Rubber Co., common	196	199
Miller Rubber Co., preferred	94	96
Portage Rubber Co., common	36	38½
Portage Rubber Co., preferred	92	95
Swinehart Tire & Rubber Co	77	78
United States Rubber Co., common	43½	45
United States Rubber Co., preferred	102	104

RUBBER COMPANY DIVIDENDS.

The American Chicle Co., of New York, paid on July 20 a monthly dividend of 1 per cent. on its common stock.

The Hood Rubber Co., of East Watertown, Massachusetts, has declared a quarterly dividend of 1¾ per cent. on its preferred stock, payable August 2 to stockholders of record on July 30.

The Kelly-Springfield Tire Co., of New York, paid on July 15 a quarterly dividend of 1½ per cent. on its common stock.

The United States Rubber Co. paid on July 15 a quarterly dividend of 2 per cent. on its first preferred stock and a quarterly dividend of 1½ per cent. on its second preferred stock.

Bids will be opened by the Bureau of Supplies and Accounts, Washington, August 17, on 5,000 feet of rubber deck hose, 4,000 feet unlined linen hose and a quantity of air and suction hose, under schedule 8621.

MR. DANIELS THANKS THE RUBBER COMPANIES.

Secretary Daniels of the Navy sent complimentary letters on July 23 to the presidents of eight large industrial companies which had recently shown their patriotism by encouraging their employees to serve in the militia, including the naval reserve. The Secretary thanked them for their assistance towards increasing the national defense. Among those who received these letters were Col. S. P. Colt, president of the United States Rubber Co., and Elisha S. Williams, president of the Rubber Goods Manufacturing Co. and of the Hartford Rubber Works Co.

PERSONAL MENTION.

George E. Pell and L. W. Dumont have formed a partnership, as dealers and brokers in crude rubber and gums, under the name of Pell and Dumont, with offices at 66 and 68 Broad street, New York.

Bertram G. Work, president of The B. F. Goodrich Co., is on his way to the Pacific Coast, where he will visit the San Francisco fair. He plans to be absent from his office until September 1.

Frank A. Seiberling, president of the Goodyear Tire & Rubber Co., has been made a member of the board of directors of the American Society of Aeronautic Engineers, of which Thomas A. Edison is chairman.

E. de Kruyff, of Buitenzorg, Java, representative of the Netherlands East Indies at the Panama-Pacific International Exposition, spent a number of days in New York prior to embarking, on July 17, on the return voyage to Java. Mr. de Kruyff was vice-president of the International Rubber Congress and Exposition held at Batavia last fall and is prominent in rubber matters in the Far East.

S. M. Evans, vice-president of the Pitcher Lead Co., has recently been elected a member of The Merchants' Association of New York City.

S. P. Thatcher, formerly chemist of the Peerless Rubber Co., has recently assumed charge, as chemist, of the New York laboratories of the United States Rubber Co.

The Simplex Wire & Cable Co., of Boston, is now represented in New York City by William K. Sparrow, with an office at 30 Church street.

Joseph H. Liston succeeds J. E. Duffield as manager of the Chicago branch office of the Thermoid Rubber Co. of Trenton, New Jersey.

H. W. L. Kidder has recently been appointed manager of the Toledo, Ohio, branch of the B. F. Goodrich Co., succeeding C. W. Wacker, who has been appointed to the management of the Cleveland branch.

H. C. Gentry represents the Acme Rubber Manufacturing Co. of Trenton as manager of that company's tire and mechanical goods sales in the Carolinas, Tennessee, Georgia and Florida.

The yacht "Invader" owned by C. W. Baird, assistant treasurer of the Rubber Trading Co., of New York, recently won the silver cup offered by the Columbia Yacht Club in the speed contest. The "Invader" has a maximum speed of 35 miles an hour.

L. C. Lawton, formerly president and general manager of The Chicago Rubber Co., 218 West Madison street, Chicago, is now located in the Hub building in that city, exploiting The Dutch Guiana Culture Co., of which he is president.

A PROTEST FROM MR. MULLER'S BROTHER.

The July number of this journal contained a brief paragraph regarding the execution by the British government of a man by the name of F. Robert Müller, convicted of being a German spy. It was stated that it had been thought that this was the F. Robert Müller, who once was connected for a brief time with the Boston rubber trade, but that a letter had been received in Boston to the effect that the former rubber man, so far from being a German spy, was a private in the British army.

A letter has been received in this office from H. Christie-Miller, of London, protesting against the impression existing in some quarters that the convicted spy was his brother. F. Robert Müller. He writes: "No more loyal Scotsman ever drew the breath of life, and he is the descendant on his mother's side of a very ancient Scottish family." The friends of the former Boston rubber man will be very glad to know that he is a distinct person from the man who recently received so much unhappy publicity. The name not being a common one, it was perhaps natural, though unfortunate, that this confusion of identity should have occurred.

TRADE NEWS NOTES.

The Faultless Rubber Co., of Ashland, Ohio, gave a dinner on July 8 to its traveling men and heads of departments, the party journeying to LeRoy in the private car of F. E. Myers. Addresses were made by various members of the group and views expressed, the consensus of which was that a great business can only be built up by mutual interdependence between the manufacturing and selling departments.

The Gryphon Rubber & Tire Corporation, recently organized with a capital of $600,000, has secured a plant at Mt. Vernon, New York, where it expects to manufacture pneumatic tires under a patent by I. S. McGiehan, of London. The plant is 65 x 135 feet, 3 stories high, and will be equipped to produce at the start 250 tires daily.

The United States Tire Co. has opened a direct factory branch at Columbia, South Carolina, in charge of J. E. Doyle, also a sales branch at Macon, Georgia, with J. P. Newsome manager.

In connection with the forty-third annual meeting of the Carriage Builders' National Association, at Cleveland, Ohio, September 20-25, there will be held an exhibition of parts of vehicles and of new models and inventions, with the materials used in their construction.

Reports on conditions at the plant of the Kelly-Springfield Tire Co., at Akron, Ohio, indicate a large gain in this company's business over last year, the increase for the year, if proportionate with that made up to the present time, being esimated at $3,000,000, with total sales of $8,000,000. The company is now operating full time, day and night, putting out 1,000 tires a day.

The Monarch Stitched Tire Co., a concern incorporated in Maine in December, 1914, with a capital stock of $500,000, is reported to have purchased a plant at Seymour Park, near New Britain, Connecticut, where it will engage in the manufacture of a newly patented tire which, it is claimed, is proof against blowouts. Operations are expected to commence within the next few weeks.

The Fisk Rubber Co. has opened a branch service station in Toledo, at 233 Twenty-first street, in charge of G. C. Wilcox. A two-story brick building has been erected to afford room for an adequate service department and a large stock of tires.

A new vulcanizer has been installed at the factory of the International Rubber Co. at West Barrington, Rhode Island, which considerably increases the capacity of the mill for the manufacture of sheeting and carriage cloth. Another calender is also soon to be added to the equipment of this plant.

The Brooklyn Shield & Rubber Co., Inc., Sumner avenue, Brooklyn, which is an amalgamation of the Brooklyn Shield Co., The Brooklyn Rubber Co. and H. P. Rindskopf, is making bathing cap stocks and is about to put a new bathing cap on the market. The company has in contemplation the addition of a plant for the manufacture of mechanical goods.

A recent product of the Dryden Rubber Co., of 1014-22 Fourteenth street, Chicago, is the Dryden Endless Inner Tube. This tube is in the shape of the tire and the valve is attached by a special method. It is said to be something entirely new and is attracting the attention of the tire trade.

DOMESTIC PRODUCTION OF BENZOL.

There are about ten benzol plants now being erected in the United States, or contemplated, some of them being very near completion. The United States Steel Corporation is putting up three, one in the West, one in the Pittsburgh district and the third at Birmingham, and is planning to build two more. The Republic Iron & Steel Co. is building a benzol plant in connection with its Hazleton coke works. Among other concerns erecting similar plants are the Lackawanna Steel, the Inland Steel and Cambria Steel companies.

The estimated yield of benzol from a ton of coking coal is between two and three gallons. A conservative estimate of the total production from the plants now under construction is 30,000 gallons daily.

The Sydney (Nova Scotia) Steel Mills have established a benzol plant, the product being converted into toluol and naphthaline.

The Edison benzol plant at Bessemer, Alabama, has been completed and is turning out about 2,000 gallons of benzol per day. It is the first of its kind in the South.

SWITZERLAND SEEKS DYESTUFF TRADE WITH AMERICA.

Soon after the outbreak of the war the German government placed severe restrictions on the export of coal tar intermediates. Since then England has been sending quantities of benzol, toluol, naphthalene, aniline, etc., to Switzerland and receiving finished dyestuffs in return. This arrangement has contributed materially to lessen the scarcity of colors in Great Britain. But because of the demand for high explosives England now needs for herself all these materials she can produce. The Swiss are now looking to the United States as a source of coal tar intermediates for manufacturing the dyestuffs so much in demand here and in other countries. Certain Swiss firms propose that American producers of intermediates send them pure coal tar hydrocarbons such as benzol, toluol, naphthalene, etc., to be paid for by an equivalent amount of finished dyes. This offer may be well worth considering, for a proper arrangement might lessen the discomfort to American textile and other industries, rubber included, resulting from the shortage of dyestuffs.

CHEMICAL INDUSTRIES EXPOSITION.

The National Exposition of Chemical Industries will be held the week of September 20 at the Grand Central Palace, New York. It promises to be of great interest and educational value to technologists, manufacturers using chemical products and the general public. Space has been taken for exhibits by several United States Government Bureaus and also for a collective exhibit by Canadian manufacturers. An interesting program is in preparation for lectures and chemical and engineering meetings during the exposition.

The Exposition has been organized, with the co-operation of the International Exposition Co., by Messrs Nagelvoort and Roth with executive offices at Grand Central Palace, Forty-sixth street and Lexington Ave., New York.

ATTRACTIVE HARD RUBBER SPECIALTIES.

The Vaughan-Upton Co., 251 Causeway street, Boston, is making an exceedingly attractive line of hard rubber writing specialties under the trademark name of "Vuco." The line consists of fountain pens, pencil holders for the economical consumption of small pencil ends, and holders carrying small leads, as well as the "Vuco" self-ejecting pen-holder and the "Golfer," a compact little gold-banded pencil with a chain ring, especially adapted for the use of golf players.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

TRADE NEWS NOTES.

The Harmer Rubber Works at East Millstone, New Jersey, suffered damage from the severe storm of July 8, the sheet iron roof of the plant being completely torn off by the wind.

The Braender Rubber & Tire Co., of Rutherford, New Jersey, is now represented in the State of Maryland by the McGraw Tire Co., Inc., of 10 West Oliver street, Baltimore, its former distributing arrangements in that city being discontinued. This company has also made a change in its representation in New Jersey, where it purposes placing its product with dealers in the principal large cities.

The fire which occurred at the Barrett Manufacturing Co.'s benzol plant at Philadelphia, about the middle of July, caused only slight damage, being extinguished by the company's fire fighting force before the arrival of city firemen.

The June "Bulletin of the Pan-American Union" contains a four and a half page article, re-printed from the April number of the Spanish edition of the "Monthly Bulletin" on the Forsyth Dental Infirmary at Boston, which has been mentioned at various times in this publication and which was erected by John Hamilton Forsyth and Thomas Alexander Forsyth, of the Boston Belting Co., in memory of their deceased brothers and presented to the city as an infirmary for the children of Boston.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, is manufacturing a Ford type oil-proof vacuum cup tire, 31 x 4. This casing is of extra weight and strength, designed for use on rear wheels of Ford cars used for commercial purposes. It is guaranteed for 4,000 miles.

The tire output of the United States Tire Co. totals slightly over 9,000 automobile tires per day, or 30 per cent. ahead of last year. With the addition of more machinery in the Detroit factory that plant alone will be in position to manufacture 10,000 tires a day. The company expects a production of 1,500,000 tires this year.

Among the exhibitors of the Railway Supply Manufacturers' Association at Atlantic City, held June 9 to 16 were the Goodyear Tire & Rubber Co., Akron, Ohio, which showed samples of Suber's hose; Jenkins Bros., New York City, exhibiting mechanical rubber goods, sheet packing, gaskets, valve discs and rings, new oil-proof sheet packing and car heating discs, and H. W. Johns-Manville Co., New York City, which had a display of friction and rubber tapes.

The name of the Peerless Tire & Rubber Co. has recently been changed to the A. F. Wolke Rubber Co. The capital stock has also been increased from $10,000 to $25,000. The debt limit is fixed at $10,000. Incorporators are A. F. Wolke, Charles H. Wolke, Keith L. Bullitt and J. P. Glenn.

The receiver of the Pope Manufacturing Co., Hartford, Connecticut has sold an option on an unexpired contract for automobile tires, signed by the Hartford Rubber Works Co., now part of the United States Tire Co., to the Maxwell Motor Co., of Detroit, for $70,000 cash.

W. J. Spencer, of Philadelphia, expects to place his "Noair Compression Tire"—described and illustrated on page 437 of the May issue of this publication—on the market through the Essex Rubber Co. of Trenton, New Jersey.

William Wiltshire of the Cline Co., of Los Angeles, California, has devised a means of protecting the cheekbone of the gunner who uses a hard-kicking "Springfield." He cuts away the stock of the gun at the offending point and sets in soft sponge rubber covered with chamois leather.

A new tri-car chemical fire engine has just been brought out in New York by the Woodhouse Manufacturing Co. This machine, which is made by the Davis Sewing Machine Co., of Dayton, Ohio, is supplied with Dayton airless tires, made by the Dayton Manufacturing Co., and carries, with its other equipment, 200 feet of ¾-inch chemical hose.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

TRADE is seasonably active, with some lines in good demand, others not. For instance, last month and the previous one were the rainiest June and July on record in New England. This had the effect of stimulating the retail trade in rain-proof clothing and in light weight rubber shoes, while it had just the opposite effect on the hose business. The tire people seem to be fairly well satisfied with present trade and the belting business is having somewhat of a boom because of the advance in leather belting prices, which have greatly increased because of the European demand for army shoes, harness and military accoutrements. The demand for rubber soles and heels is also good for the same reason. Mechanicals and druggists' sundries are in good demand, while fruit jar rings are going out, seemingly, by the million.

* * *

The Boston Woven Hose & Rubber Co. Mutual Benefit Association, held its first annual field day at Lexington Park, Mass., on July 3. The outing was attended by 600 members and proved very enjoyable. The program included a varied list of sports for both men and women, and a ball game. The latter was played between the Woven Hose and the Edison Light ball teams, both members of the Mercantile League. The score was 8 to 4 in favor of the Woven Hose nine. Appropriate prizes were awarded to the winners in each event. The day's enjoyment concluded with dancing in the evening.

* * *

The United States Rubber Co. of New England is now well settled in its great seven-story building just across Fort Point Channel, on Summer street, about five minutes' walk from the South Terminal station. Here the company occupies nine floors (including basement and sub-basement) with a frontage of about a hundred feet and approximately 100,000 feet of floor area. This affords ample space for the big stocks of goods formerly carried in the five stores which have been consolidated. The store front, with its plate glass first-story, is a handsome one. The various trade mark brands are emblazoned in gold on the windows, and an illuminated sign bearing the "U. S." seal or trade mark shines over the doorway.

The first floor contains the business offices, the sample exhibition and the accounting department. President W. H. Porter has a commodious office at the right of the front door, where he is at all times ready to welcome the visiting customers, and able to have a supervising eye over the whole floor. The information desk is back of the big rubber mat bearing the new "U. S." trade mark or seal, and is in charge of Wallace Campbell, who is an animate directory of the entire establishment.

Back of Mr. Porter's office is the exhibition or sample room, where, in electrically lighted plate glass cases, are samples of the many lines of goods made by the various consolidated companies. One case is filled with tennis shoes; another with rubber footwear, and here are to be seen some very unique specimens of colored and particolored rubbers. A third showcase is devoted to fountain syringes and hot water bottles, and others to bathing caps and swimming accessories, automobile inner tubes, patches and cements, and to various druggists' sundries. Around the walls and posts are frames containing samples of small molded goods, mechanicals and similar articles.

Back of this room is a row of offices occupied by the managers of the various footwear lines. These are occupied respectively by Charles T. Cooper, manager of the Candee branch; Chester J. Pike, Jr., Hubmark; Clarence L. Weaver, Banigan; H. C. Kalish, Wales-Goodyear, and E. B. Swett, American.

At the left of the entrance is the private office of assistant treasurer, F. A. Cyr, while beyond, and occupying nearly one-half the first floor, is the accounting department, admirably arranged for efficient work. Back of this is the tire department, in charge of Ralph E. Jackson, and the mechanical department, under R. J. Barker. At the rear is the shipping room, with openings on a driveway at the rear of the building.

The second story is devoted entirely to the raincoat business, while the five upper floors, also the basement and sub-basement, contain the stocks of goods. Taken in all its bearings, the move is an important one, and the one great building a fine home for the consolidated business.

FIRST ANNUAL FIELD DAY OF THE BOSTON

* * *

At the United States Rubber Co.'s headquarters at 140 Essex street one of the sample rooms contains a table on which is shown the largest variety of cemented tennis and other cloth-upper rubber sole shoes on display in this city. While many dealers have full catalogs and price lists of these lines, visiting buyers—who were numerous last month—expressed their surprise at the large variety and the beauty of the samples shown.

* * *

The Enterprise Rubber Co. has for eight or nine years carried on an extensive retail rubber business on Federal street, and the store, with its big plate-glass windows, was one of the attractions of the street, which was promenaded by thousands of business men and women on their way to and from the South Terminal station. The removal of the Candee branch store to the new building on Summer street was the cause of a big clearance sale in June and on the first of July the business was taken over by the Gillett Rubber Co. M. D. Gillett, who has been with the Enterprise company since its establishment in this store, is the manager.

Many readers of THE INDIA RUBBER WORLD are intimately acquainted with John Hopewell, formerly president of the Reading Rubber Co. Mr. Hopewell still retains his business interests in several manufacturing industries, but has turned over to others the rubber business. He is the owner of Maple Ranch Farm, Natick, one of the finest farms in New England, where he has carried on many interesting experiments in agriculture, and where he spends a large part of the year.

* * *

Last month mention was made of the collision between the yacht "Vanadis" and the Boston-New York steamer "Bunker Hill" which resulted in the death of President Kendrick, of the Boston Packing & Belting Co. At that writing few knew that S. P. Sharples, the venerable analytical chemist, whose work in the rubber industry is so well known, was on the same steamer. His stateroom was demolished by the impact of the yacht, but, happily, Mr. Sharples was not in his stateroom at the time, and this is the reason why he is still alive and active and was able to participate, as usual, in the enjoyments of the Rubber Club at its outing mentioned elsewhere in this issue.

* * *

A report appeared in the daily papers of July 19 to the effect that a seven-year-old boy, son of F. C. Hood, a Boston manufacturer, had been drowned at a summer camp. The father of this boy is not Frederic C. Hood, the president of the Hood Rubber Co. Mr. Hood's only son is 21 years of age and a recent graduate of Harvard.

* * *

Charles Rogerson Haynes, connected with the experimental laboratories of the United States Rubber Co. in Naugatuck, Connecticut, was married on July 21 at the historic North Church in Boston, to Miss Annette Austin, daughter of a former mayor of Galveston, Texas, but who has more recently lived in New York City, where she has gained a reputation as a writer on scientific subjects.

WOVEN HOSE & RUBBER CO. MUTUAL BENEFIT ASSOCIATION.

The filing of a petition in the United States District Court at Boston recently by Maurice G. Sollers, holder of 60 shares of preferred stock of the Walpole Tire & Rubber Co., asking permission to intervene in the case for the purpose of taking appeals from decrees of the court ordering the sale of the property and in confirming the sale, introduced a new phase in the long drawn out litigation in the settlement of the affairs of that bankrupt corporation.

Mr. Sollers' petition stated that he believed the assets purchased by the New York creditors' committee for $780.000 to be worth more than that amount and also that there was $1,900,000 worth of preferred stock and $1,500,000 common stock of the company still outstanding which would be worthless unless the two decrees were reversed or modified. He asked permission to enter the case in order that he might appeal from the decrees in behalf of himself and a group of stockholders who desired such action.

Attorney Plante, counsel for the creditors' committee which purchased the company's assets, objected to the allowing of the petition before Judge Dodge. He stated that the petitioner had had ample time to object to the decrees, but had not been in court once or made any objection to the proceedings. He said that it would be impossible now to get the parties in the case back to their original status inasmuch as the majority of the assets purchased have since been sold to the Revere Rubber Co. The filing of this petition marked the entrance into the case of a new stockholders' committee made up of preferred shareholders, said Attorney Plante.

Judge Dodge denied the petition.

* * *

Vice-President and Manager LeBaron C. Colt, of the National India Rubber Co., at Bristol, has had a large room at the factory equipped as a hospital room and another room fitted up as a reclining room for the women employees of the plant. A room for first aid to persons who were ill or had become injured has been maintained at the factory for several years, but the new hospital and reclining rooms are more elaborate.

The hospital room is on the first floor near the calendering room and is immaculate in its finishings and furnishings of white. It is fitted with the latest appliances used in hospital work. A trained nurse engaged for duty at the factory recently began her work in that capacity. She is also to be on duty nights at the DeWolf Inn, where a number of the women employees live.

The reclining room and first aid room for women operatives is a little larger than the hospital room—which is 15 x 40 feet—and is located on one of the upper floors at the north side of the plant near the stitching and shoemaking departments, where the greater number of women are employed.

The output of tennis shoes at the factory of the National company is increasing so that from 10 to 14 freight cars of

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber industry throughout Rhode Island continues active. All the manufacturers report good orders with little prospect for any extended shutdown this summer, as has been the case in years past. Most of the factories that are making footwear are in receipt of orders enough to keep them going all summer, it is reported, while the plants that are making tires, automobile accessories and medical goods are working overtime—a condition partially explained, at least, by the continued demand for tires and other rubber goods from Europe.

that product are shipped every day. There are now about 3,000 employees of both sexes at work in the plant, and an average of 37,000 pairs of tennis shoes of every description are being turned out every working day.

Extensive repairs, alterations and improvements are under way at this plant which are intended to greatly increase the capacity and efficiency of the property. Not the least of the present work is the development of new plans for better and more complete fire protection, and to this end the fire walls of the storehouses, especially, are being strengthened and improved.

Late in June the severest hail storm within the remembrance of any one living in this State passed over Bristol, causing several thousand dollars' loss in damage to various buildings. At the National factory over 3,000 panes of glass were broken in windows and skylights—incidentally, the women employees being thrown into quite a panic. Other factories suffered in the same way, though to a less degree.

* * *

Notices were posted at the Alice and Millville mills of the Woonsocket Rubber Co. on July 16 announcing the annual summer shutdown of two weeks for stock taking and general repairs, the last day's making to be Friday, July 30. The Alice mill, at Woonsocket, employs about 1,500 hands, and 700 are employed in the Millville factory, at Millville.

Business has been so brisk at the two mills of the company that there was some doubt as to whether or not the annual closing would take place this year. The necessity for stock taking and repairs, however, forced the step. There is every assurance that the excellent business conditions which have prevailed at these factories for a number of months past will continue for the remainder of the year.

* * *

The Smith Webbing Co., Pawtucket, has recently been taken over by the Everlastik Co., of Massachusetts, which, though of comparatively recent origin, has taken over several webbing plants in Massachusetts. The Smith Webbing Co., which was owned largely by Pawtucket and Central Falls interests, has been engaged in the manufacture of elastic and non-elastic webbing and has lately built up a large business in a patent elastic belt. The late Charles S. Smith, who was the president and controlling factor in the concern, was killed in an automobile accident a few months ago in Pawtucket.

* * *

The promptness with which the ranks of the military organizations of Rhode Island are being filled since the movement started by the United States Rubber Co. in advocating that its employees identify themselves with the National Guard is causing considerable comment. Many men of military age in the employ of the rubber firm have already joined the service, while many more are considering similar action. The example set by the United States Rubber Co. has been followed by many of the large concerns in this vicinity.

* * *

The Revere Rubber Co. has erected a large addition to its office building in Providence, which more than doubles the capacity of the former quarters. The company is working overtime four or five nights a week making solid tires, some of which are going abroad, and also turning out large quantities of rubber thread for elastic fabrics.

Since the setting up of the new vulcanizer at the plant of the International Rubber Co. at West Barrington the force of help in the plant has been considerably increased. The concern has a large booking of futures and the indications are for steady operation for many months to come.

Hill & LaCrosse, of Pontiac avenue, Cranston, manufacturers of elastic webbing, are making extensive additions to their plant.

The No. 2 rod mill of the Washburn Wire Co. in Phillipsdale, was closed the last week in June and the first week in July while a new bed was being placed beneath the engine in that department. Foundations are being put in for an extension of the yard crane at this plant, which will almost double the area reached by the crane, which is used in shipping, receiving and distributing stock.

The Phillips Insulated Wire Co., Pawtucket, has awarded the contract for the construction of a one-story machine shop, 60 x 100 feet.

* * *

George Nicholson, treasurer of the Nicholson File Co., Providence—an uncle of S. M. Nicholson, director of the United States Rubber Co.—died of Bright's disease July 16 at his home, 181 Adelaide avenue. He was 72 years old and had been ill for about three months. He was born in Pawtucket, this State, in 1843, and when a young man removed to Whitinsville, Massachusetts, but soon returned to Providence. He had been treasurer of the Nicholson File Co. for the past 54 years. He is survived by his wife.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

NO better indication of the condition of the rubber business in this city can be found than that contained in the report of the tax commissioner for the county, which shows an increase in personal property valuations since the report of last year amounting to $1,333,000, with land values remaining the same as a year ago. Of the principal companies the largest increase is in the holdings of The B. F. Goodrich Co., whose reported valuation of combined personal and city property is $21,000,000, or $1,000,000 in excess of that of last year. This company will pay the highest taxes collected by the city, $138,000. The Goodyear Tire & Rubber Co. will pay $67,000 taxes. The personal property of this company is listed at $4,944,000, or $200,000 less than a year ago, this decrease being attributed to shortage of stocks of rubber and other raw materials early in the year, when the embargo was in force, the appraisal being based on a monthly average for the year. The next largest valuation is that of the Firestone Tire & Rubber Co.—$4,130,000—which is $100,000 over that of 1914. The Kelly-Springfield Tire Co. shows an increase of $166,000, with a total of $848,000; the Miller Rubber Co. a gain of $42,000, with a total of $685,000; the Swinehart Tire & Rubber Co., $71,000, with a total of $310,000. The Portage Rubber Co. reports a personal property value of $177,000, which represents a $16,000 increase. The personal holdings of the Marathon Tire & Rubber Co., of Cuyahoga Falls, near Akron, are listed at $184,000, an increase of $69,000, and those of the Falls Rubber Co., of the same place, at $135,000, or $66,000 over those of last year.

Practically every rubber factory reports excellent business and full time operation of plants, one company even finding it necessary to call in many of its traveling men early in July because of inability, at capacity production, to turn out goods fast enough to fill orders.

The water famine which threatened at one time this summer to seriously handicap the factories of this city has been relieved by the recent heavy rains. Water shortage is a condition not likely to be repeated, however, for the new water works system, now almost completed, will be capable of supplying water at the rate of 35,000,000 gallons a day even in unusually dry weather. The present average daily consumption is placed at 12,500,000 gallons. The Cuyahoga river is the source of supply for the new system, an area of about 1,400 acres bordering on this stream having been purchased and developed for the purpose, at a total cost of about $4,500,000.

* * *

Work has been started on the new six-story building of

The B. F. Goodrich Co. This building will be L-shaped, with each wing about the length of a city block. The construction company has promised its completion, ready for machinery installation, by late fall.

The publicity department of this company has recently been making some rough estimates of the saving to tire users throughout the country effected by the price reductions that took effect early in the present year. This is placed, at an average of $3.50 per tire, at about $25,000,000 per year. It would, however, undoubtedly reach considerably larger figures, for this estimate is based on but one set of tires per year for each of the 1,623,555 cars carrying pneumatic tires now registered in the United States.

The Goodrich Silvertown Cord tire has been conspicuous in a number of the late racing events.

The Goodrich company has issued the following statement in regard to operating results in the first half of 1915:

"After making proper allowances for maintenance, depreciation, bad debts and all outstanding liabilities, etc., the net profits for the period amounted to approximately $4,000,000.

"The company has redeemed and cancelled out of surplus preferred stock to the value of $2,000,000, leaving $28,000,000 outstanding. The amount of quick assets over current liabilities shows a gain of approximately $3,016,866.16 for the period.

"The officers have recommended to the board of directors that no dividend be declared on the common stock at this time."

These figures indicate a considerable gain over those for the corresponding six months of 1914, when the net income after maintenance and depreciation had been provided for amounted to $2,651,278.

* * *

At the factory of the Firestone Tire & Rubber Co., where work is being rushed both in the present plant and on the new additions, the employees are enthusiastic over the annual picnic which is to be held at Silver Lake Park on Saturday, July 31. A full program of sport events has been arranged, and an attendance of about 5,000 is expected.

The Firestone company has announced plans for a club house for employees, to be built this summer opposite the plant on South Main street. It will contain a swimming pool, shower baths, bowling alleys, a barber shop and a model restaurant, and will be connected with the factory by a tunnel under the street.

* * *

The Portage Rubber Co. will give an annual outing to its employees on August 7. Arrangements have been made for special cars to convey them to Springfield, where the outing will be held on the shores of the lake.

* * *

On August 14 the Miller Rubber Co. will give an outing. The Miller company is making a new rubber sponge said to possess all the qualities of the ordinary rubber sponge with added durability and to be made by the addition to the rubber of a compound which has the same effect on the rubber that yeast has in bread, the mixture being baked and expanding as it becomes heated.

This company is enjoying a war business in tires not only in Europe, but in Mexico, where automobiles have come to play an important part in the continued military operations. Miller tires are being supplied for the army transports and military automobiles of the Villa forces.

* * *

The Goodyear Tire & Rubber Co. reports an excellent business in hose during the season, as well as in all lines of mechanical rubber goods. During the first six months of the year 3,700,000 feet of hose, a quantity equal to its entire production in 1914, was turned out in the Goodyear factory, and in one recent week alone the output amounted to 240,000 feet.

This company is about to construct a model system of gas tanks approved by building inspectors as completely eliminating dangers arising from the storage of gasoline, against which legislative restrictions were passed a few weeks ago. This system provides for 10 to 15 tanks, each insulated in water to prevent leakage and consequent danger of explosion.

The rumor—not as yet officially verified—is current in this city that a gigantic war dirigible is now in process of manufacture by the Goodyear company for the United States government, as a test machine, which, if successful in operation, will be adopted as a type for use in the aerial service of this country and to form a nucleus of a dirigible squadron.

* * *

Work was begun early in July on an addition to the tire plant of the Mohawk Rubber Co. This company doubled its plant area by its building operations of last spring, and this new addition will mean a similar increase.

* * *

The manufacturers of rubber mill machinery are also running their plants to capacity, and the Adamson Machine Co., in a report at its recent quarterly meeting, showed all departments operating 24 hours a day. The company has declared a quarterly dividend of 2½ per cent., payable August 1, which is ½ per cent. in excess of the previous quarterly stock dividends of this concern.

* * *

The court has dismissed, on a technicality, a petition filed by a stockholder of the East Palestine Rubber Co., of East Palestine, Ohio, that that company be placed in the hands of a receiver.

The Republic Rubber Co., of Youngstown, about July 1 received a cable order for $500,000 worth of solid rubber tires for export to Europe, the order calling for delivery of 10,000 tires per month, built on special steel rims, for use on army trucks. This followed an order now almost completed, from the same source, for $250,000 worth of similar tires.

The McClurg Rubber Co. recently organized to manufacture rubber tires, expects soon to commence operations. The following officers have been elected: President and general manager, J. S. McClurg; vice-president, C. M. Christensen; secretary and treasurer, H. T. Forrest. These officers, with W. Z. Davis and J. L. McClurg, compose the board of directors.

* * *

A. H. Marks, vice-president of The B. F. Goodrich Co., spent a few days in Akron early in July, attending a meeting of directors of the City hospital, for the consideration of plans for hospital additions, and also to look after business at the plant, returning to his summer home at Marblehead, where his yacht is stationed. He has recently had a pipe organ installed in this new yacht.

W. F. Pfeiffer, secretary and general manager of the Miller Rubber Co., and Mrs. Pfeiffer have returned from their visit to the California expositions and other points of interest on the coast.

W. C. Swift has resigned his position as efficiency engineer with the Miller Rubber Co. and is reported to intend removing to New York.

P. W. Litchfield, factory manager of the Goodyear Tire & Rubber Co., completed 15 years of service with that concern on July 15. A banquet was tendered him by the company, at which he announced his intention of donating $100,000 to the welfare work of the employees, and a committee of workers has been chosen to formulate rules by which this fund is to be used for their welfare.

Irene Seiberling and Penfield Seiberling, daughter and son of F. A. Seiberling, president of the Goodyear company, were passengers in one of the recent flights of the balloon "Goodyear."

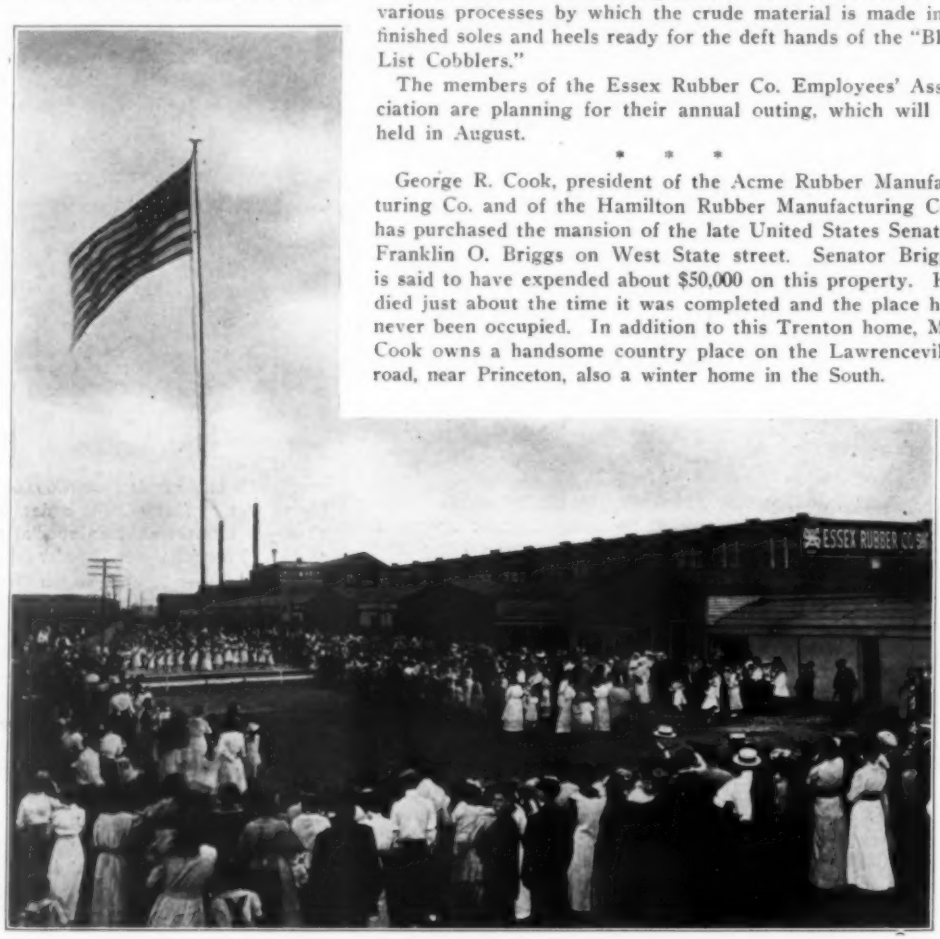
THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

A FINE demonstration of patriotic zeal occurred at the plant of the Essex Rubber Co., July 2, when an American flag, 15 x 25 feet—the largest flag in the city of Trenton—was raised aloft on a steel staff 80 feet high. The staff was erected by the company and the flag was presented by the employees.

Several hundred people braved a heavy rain storm to witness the exercises. Former Governor Edward C. Stokes was to have delivered the chief address, but at the last moment other appointments caused him to cancel the engagement. Hon. William J. Crossley, former prosecutor, spoke eloquently on "Our Flag! What it Means to Us."

The opening number on the program was a reception by the Essex Rubber Co. and employees to the invited guests, including members of the families of employees. Incident to this there was an inspection of the plant. Then the guests, led by a brass band, marched to the base of the flag staff. The Reverend William Solaini, city missionary, delivered an invocation, after which Mr. Crossley made his address. Then Miss Mary Oakley, daughter of C. H. Oakley, who had been chosen by the employees to portray the part of "Columbia," marched to the platform at the head of 13 little girls—daughters of employees—representing the Original States and carrying the flag. The children, all in white, presented a pretty sight. Miss Helen E. Fried, a daughter of one of the employees, was chosen to raise the flag. As it floated out on the breeze, a bugle corps sounded "To the Colors." Then came the singing of "America," led by the band. At the close of the exercises there was a national salute of 21 guns by Garfield Battery A, Sons of Veterans Reserves.



FLAG RAISING AT THE ESSEX RUBBER CO. PLANT.

The flag raising was the outcome of the annual meeting of the Essex Rubber Co. Employees' Association, which was held on Flag Day. One of the employees suggested that it would be a fine thing to present a flag to the company if the firm would erect a pole. This, it was suggested, would serve a double purpose, in registering devotion to the government and loyalty to the company. Among the members of the organization are many men of foreign birth, whose native countries are now at war with one another, yet they embraced with unfeigned enthusiasm this opportunity to give tangible evidence of their love for the land of their adoption. A resolution was drawn up at the meeting for presentation to the heads of the company offering to give the banner: "To express our loyalty to our country, where we may freely exercise the right to life, liberty and the pursuit of happiness, as guaranteed by our Constitution and to show our thankfulness that we are now enjoying peace and prosperity."

Prior to the flag raising ceremonies the inspection of the plant proved a genuine treat for those who were unfamiliar with the methods of working rubber. The visitors saw the various processes by which the crude material is made into finished soles and heels ready for the deft hands of the "Blue List Cobblers."

The members of the Essex Rubber Co. Employees' Association are planning for their annual outing, which will be held in August.

* * *

George R. Cook, president of the Acme Rubber Manufacturing Co. and of the Hamilton Rubber Manufacturing Co., has purchased the mansion of the late United States Senator Franklin O. Briggs on West State street. Senator Briggs is said to have expended about $50,000 on this property. He died just about the time it was completed and the place has never been occupied. In addition to this Trenton home, Mr. Cook owns a handsome country place on the Lawrenceville road, near Princeton, also a winter home in the South.

Announcement has been made by Former Judge Gnichtel, representing the widow of Arthur R. Foley, salesman for the Home Rubber Co., who lost his life on the "Lusitania," that the suit for damages instituted by Mrs. Foley against the rubber concern under the Employers' Liability law will not require the presence in court of witnesses. The case will be submitted on briefs. The only question in dispute is whether the sinking of the steamer was an accident. Former Assemblyman Frank B. Jess, of Camden, is counsel for the rubber company.

* * *

The American Rubber Manufacturing Co. of New Jersey, whose plant was destroyed by fire April 27, started last week in its newly built factory to make mats and soles, and reports a good line of orders on hand. Much of the machinery in the old plant was saved.

The organized tire workers from the various Trenton factories have begun to hold mass meetings for the recruiting of more members. No indications of a demand on the factory owners have thus far appeared, but it is probable that some such move is contemplated. It is a little more than 20 years since the manufacture of automobile tires was begun in Trenton, soon after the first automobiles came into use. During this time the industry has grown to large proportions and several hundred men are now employed in the local factories in this line of business.

* * *

Lambertville is to have another rubber factory—a tire making concern—if negotiations now under way do not fail. Those interested in trying to get the company to locate there will not for the present divulge its name.

* * *

Another raincoat company, The Trenton Co., has been formed in this city. The members of the firm are Daniel J. Madden and Alfred Schragger, and their plant will be at 226 and 228 South Warren street.

* * *

Some interesting facts pertaining to the rubber industry in New Jersey are set forth in the advance sheets of the report of the State Bureau of Industrial Statistics. The report covers the field up to the first of 1914 and compares conditions of 1913 with those of 1912. The rather unusual fact is set forth that there was less capital invested in the industry in 1913 than there was in 1912, yet far more goods were manufactured.

Following are some excerpts from the report:

Number of factories engaged in hard and soft rubber manufacture, 56.

Capital invested in 1913, $30,005,296—a decrease of $809,698, or 2.6 per cent., from that of 1912.

The value of stock used in 1913 was $25,308,839—an increase of $444,079, or 1.8 per cent., over 1912.

The factory selling price of goods made in 1913 was $42,544,723—an increase of 10.4 per cent. over the previous year.

Persons employed in the trade were: Men, 8,125; women, 1,326; children, 169; total, 9,656. This represents an increase of 785 over the previous year.

The average yearly earnings of employees in 1913 was $569.87—an average increase of 4 per cent. over 1912.

THE COX AUTOMATIC LOAD REGULATED AIR SPRING.

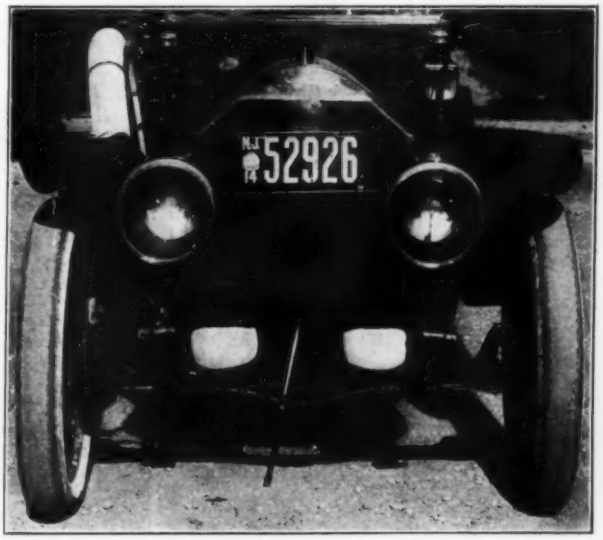
This air spring performs the function of the present leaf spring and is so arranged that the air pressure is increased and decreased automatically in accordance with the load.

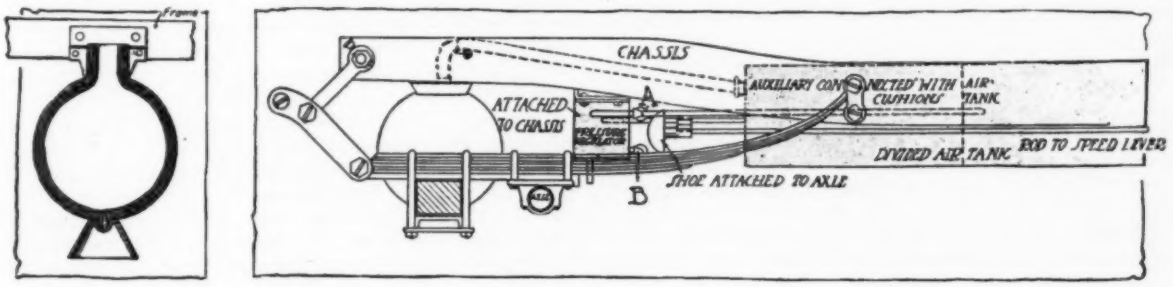
The main features are a spherically formed collapsible bulb with integral shanks, one solid and the other hollow, a pair of conically formed plungers, an auxiliary air reservoir and a pressure regulator. The bulb, or Air Cushion Spring is fabricated throughout and its construction is similar to that of the pneumatic tire. It is positioned between the pair of conically formed plungers, one of which is bolted to the axle and the other to the chassis. Conduits connect the spring via the hollow shank to the air reservoir. An air pump attached to the motor pumps the air into the high pressure tank as required, from which it passes through an air pressure regulator to the low pressure reservoir and air spring, but only as demanded by the load. When the load is removed the air pressure regulator automatically releases the then surplus air.

The resiliency of the Cox Air Spring when compared with the steel spring may be measured more accurately by the difference in the resiliency of the pneumatic tire and the solid tire, consequently the up-keep of the vehicle is reduced by quieting the vibrations and holding the tire firmly to the roadbed. The inventor believes that the experiments tried on different weight vehicles, including five-ton trucks, prove its feasibility for street cars and railroad coaches.

The accompanying photograph shows a front view of an automobile with two of these cushion springs placed in front. On a heavy truck they would naturally be used both front and rear, while with a particularly heavy load, four can be used to advantage at the rear axle. The drawing shown below gives, in the left hand panel, a cross section of the cushion while the right hand panel shows how it is attached to the chassis and the spring and how it is connected with the air tanks.

This cushion spring has been thoroughly tested in this country during the last few years and has also been examined and tested by several companies abroad, namely: The Michelin Tire Co., of Clermont-Ferrand, France; D. Napier & Son, Limited, Acton, London; The London General Omnibus Co., Limited, and George Spencer, Moulton & Co., Limited, London. [The Cox Pneumatic Cushion Co., 2010 Broadway, New York City.]





THE CARE OF FIRE HOSE.

At the convention of New York State Fire Chiefs held at Peekskill, New York, June 23-24, interesting papers were read by A. D. Fancher, of the Fabric Fire Hose Co., New York, and by M. J. Burke, of the Eureka Fire Hose Co., New York, on the "Treatment and Care of Fire Hose." Substantially the same rules were given by both authors, the gist of which was that cotton rubber-lined hose should be cleaned of adhering mud or chemicals. The rubber tube should not acquire a permanent set in folds, nor freeze or get dried out. It was recommended to straighten out the hose and wet it internally with water at least once a month.

NEW INCORPORATIONS.

Broadway Tire Exchange Co., Inc., June 26, 1915; under the laws of Rhode Island; authorized capital, $10,000, divided into shares of $100 par value each. Incorporators: Raffaele and Giustino Tortolani and David Miller—all of Providence, Rhode Island. To engage in the business of buying, selling, trading, manufacturing, repairing and otherwise dealing in automobile and other vehicle accessories and supplies.

Centaur Rubber & Tire Co., Inc., The, July 6, 1915; under the laws of Delaware; authorized capital, $500,000. Incorporators: F. D. Buck, George W. Dillman and M. L. Horty—all of Wilmington, Delaware. Location of principal office, Delaware Charter Guarantee & Trust Co., du Pont Building, Wilmington, Delaware. To import, export, manufacture and deal in, either through the medium of agents or otherwise, automobile tires and all other kinds of rubber goods.

Double Grip Garter Co., Inc., July 1, 1915; under the laws of New York; authorized capital, $25,000. Incorporators: Maude A. Latham, 407 Audubon avenue, and Dudley E. Latham, 165 Broadway—both in New York City—and Anna Kolbe, 250 Second street, Union Hill, New Jersey. To manufacture elastic and web goods, etc.

Double Service Tire & Rubber Co., The, June 9, 1915; under the laws of Ohio; authorized capital, $50,000. Incorporators: Carl F. Geyer, Max S. Glover, D. T. Bowlus, W. C. Walton and W. A. Nash. Location of principal office, Akron, Ohio.

Duncan Co., Inc., W. H., June 24, 1915; under the laws of New York; authorized capital, $5,000. Incorporators: M. M. and W. H. Duncan, Rockaway Park, Long Island, and James N. MacLean, 629 Throop avenue, Brooklyn—both in New York. To manufacture materials for auto. and carriage tops, waterproof cloths, etc.

Essex Tire Construction Co., June 10, 1915; under the laws of New Jersey; authorized capital, $125,000. Incorporators: William Barth, Madison; Frank H. Butterworth and Frederick Monro Marvin, 958-60 Springfield avenue, Irvington—both in New Jersey. Location of principal office, 958-60 Springfield avenue, Irvington, New Jersey.

Gryphon Rubber & Tire Corporation, July 9, 1915; under the laws of New York; authorized capital, $6,000. Incorporators: Samuel A. Cunningham, 2 Wall street; Percival S. Jones, 5 Nassau street—both in New York City—and Lionel Emdin, Deal, New Jersey. To manufacture rubber goods, etc.

Hawkeye Tire Co., July 3, 1915; under the laws of Delaware; authorized capital, $500,000. Incorporators: I. V. MacLean, John T. Christie, C. B. Hextell, T. H. Dexter, and E. G. Raffensperger—all of Des Moines, Iowa. Location of principal office, Equitable Building, Wilmington, Delaware. To manufacture and deal in all kinds of automobile tires, inner tubes, etc.

Miller-Baxter Rubber Co., June 29, 1915; under the laws of Delaware; authorized capital, $150,000. Incorporators: Morris E. Baxter, Alfred Peterson, Oscar L. Holl, Edward Lee Owen—all of East Liverpool, Ohio—and Hollie H. Forrest, Chester, West Virginia. Location of principal office is with Francis H. Hoffecker, 845 Market street, Wilmington, Delaware. To manufacture, purchase, buy, sell, import, export and deal generally in rubber and gutta percha, and all articles of which rubber is a component part.

Miller Rubber Co., of Canada, Limited, The, May 25, 1915; under the laws of Canada; authorized capital, $50,000. Incorporators: Michael Montag, James Miller, John Karn, Edwin Robert Patteson and Robert Burns—all of Toronto, Ontario. Location of principal office, Toronto. To manufacture, buy, sell and deal in articles composed of rubber either solely or in combination with other substances; surgical and hospital supplies, automobile, motorcycle and bicycle tires, etc.

Mutual Tire & Rubber Co., March 5, 1915; under the laws of New Jersey; authorized capital, $125,000. Incorporators: Franklin B. Platt, Joseph Hopkins and William J. Dallas—all of Haddon Heights, New Jersey. Location of principal office, 531 Federal street, Camden, New Jersey. To manufacture, buy, sell and exchange tires, casings, tubes and liners of all kinds, etc.

Newark Mat Co., Inc., July 2, 1915; under the laws of New York; authorized capital, $15,000. Incorporators: Clifton B. Jordan (president), 140 Claremont avenue, New York City; Charles R. Dollman (vice-president), 668 Palisade avenue, West New York, New Jersey, and Samuel A. Williams, (secretary and treasurer) 7 West Eighth street, New York City. Location of principal office, 11 Broadway, New York City. To manufacture a combination rubber-metal mat as a specialty, essentially a rubber mat reinforced by brass; also all kinds of rubber mats and matting.

Ohio Tire & Supply Co., The, May 28, 1915; under the laws of Ohio; authorized capital, $5,000. Incorporators: R. B. Tripp, George T. Miller, Lawrence G. King, Minnie R. Burnage and Clayton C. Townes. To manufacture automobile parts and accessories.

Simplex Rubber Co. of America, Inc., The, July 3, 1915; under the laws of New York; authorized capital, $300,000. Incorporators: Nathaniel A. Campbell, 31 Pine street, Albert C. Travis, 71 Broadway—both in New York City—and Evan Gwynne-Evans, Tarrytown, New York. To manufacture rubber goods of all kinds.

Star Rubber Co., Inc., July 13, 1915, under the laws of New York; authorized capital, $5,000. Incorporators: Carrie M. Downing, Vauxhall, New Jersey; D. Ronald Downing, 830 West One Hundred and Seventy-ninth street, and Samuel Gordon, 302 Broadway—both in New York City. Rubber goods, auto. accessories, etc.

Staunton Jar Corporation, June 8, 1915, under the laws of New York; authorized capital, $100,000. Incorporators: Gray Staunton, Stamford, Connecticut; William R. Smith and Odell R. Blair—both of Buffalo, New York. To manufacture jars, rubber goods, etc., under the laws of New York.

Twin City Tyre & Supply Co., Inc., July 16, 1915; under the laws of New York; authorized capital, $5,000. Incorporators: John Sloan, 854 Fourth avenue; James Hansen, 618 Third avenue—Upper Troy—and Laura Foley, 335 Tenth street, Troy—all in New York. Tires and auto accessories.

Westchester Oil & Rubber Co., Inc., July 16, 1915; under the laws of New York; authorized capital, $5,000. Incorporators: Charles E. McCormack, W. Frank Baily and Charles A. Barnard—all of Mount Kisco, New York. Auto. supplies, tires, oils, etc.

Western Reserve Rubber Co., The, July 2, 1915; under the laws of Ohio; authorized capital, $10,000. Incorporators: George E. Hall, Fred M. Hall, Arthur P. Witter, Meade Chamberlin and William C. Johnson. To manufacture rubber specialties, novelties and rubber goods of every description.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

GENERAL REMARKS.

WITH no early cessation of hostilities in sight, the rubber trade pursues much the same course from month to month. Though business all around continues to be decidedly good, troubles with regard to scarcity of labor have increased rather than diminished, and though we are by no means in the condition of the other belligerents, who have universal service, yet we continue to approach their industrial conditions more closely. The effect of the Munitions Bill is beginning to be felt in the withdrawal of skilled mechanics from works making rubber machinery to engage in the manufacture of munitions, and more unlikely things are in prospect than the taking over of rubber machinery works for the above purpose. At any rate, at the present time firms ask nine months for delivery of machinery which would in happier times have been delivered in two months. This, of course, is against development and the exploiting of new ideas with regard to tires, etc.

The biggest extension of works on hand is the new factory of the Dunlop Rubber Co., Limited. This is situated about four miles from Birmingham and work has already been started on the foundations. As great promptitude has been shown with the whole scheme, presumably the machinery is already purchased or under construction, and as the firm is so largely engaged on government work it is hardly likely that difficulties would be put in the way of obtaining the necessary machinery. With other firms, differently situated, however, great delays seem to be inevitable. The forthcoming National Service Register may possibly prove the existence of a goodly number of unemployed rubber experts willing to put their services at the disposal of their country.

A point regarding government contracts on which there appears to be some misunderstanding is that specifications regulating the exact composition of rubber goods are only issued in respect to certain goods, notably for what are known as admiralty qualities. In other cases, as, for instance, the important one of solid tires, the goods have to be up to a certain standard, but the details of their composition are left to the manufacturers. Whether high quality reclaimed rubber is used or not is a matter on which I am not qualified to speak, but its use is not forbidden except in specific instances. A recent order of the Privy Council regarding prohibited exports contains the phrase "goods made wholly or partly of rubber" instead of the former phrase "goods made wholly of rubber." Further, in addition to rubber the following are now on the list of prohibited exports, gutta percha, balata, Borneo guayule, jelutong, Palembang, Pontianak and all other substances containing caoutchouc. Under the circumstances this was only to be expected. With regard to all other substances containing rubber some complications may arise, as various names are in use for what have been for convenience styled pseudo rubbers, and, moreover, not much is known about them as to their importation and disposal. For instance, our old friend, variously known as potato rubber, *Euphorbia* gum and also Tuno gum—which I believe is not really the same thing—still comes in quantities to certain firms, while other important firms would not know it if they saw it. As caoutchouc is more widely distributed in plant life than is generally supposed, perhaps it would have been as well to indicate some such maximum amount as 2 per cent. so as to eliminate the banana artichoke and chickweed varieties.

Considering the adverse effect of the war upon trade journalism generally, it is not surprising to hear that the "Rubber World," of London, is to cease publication and be wound up. It was the last of the special journals founded during the rubber boom to survive the fallen interest of the public in the topic, and its prolonged life speaks much for the journalistic enterprise and acumen of Mr. E. A. Salmon, its guiding star.

TRADE NOTES.

It may be remembered that some time ago the Sirdar Tyre & Rubber Co., whose works are at Bradford-on-Avon, got into financial difficulties and was carried on under a receivership. Later the works were announced for sale, but were ultimately disposed of by private treaty, which involved the introduction of a considerable amount of capital. These works, which were well equipped with machinery, are now in full swing again under the old title and are busily engaged on government orders. This observation applies with equal force to the other works in the west of England, namely, the Avon Rubber Co., Limited, Spencer Moulton & Co., Limited, and Wallington, Weston & Co., Limited.

The Rubber Regenerating Co., Limited, of Manchester, continues to expand under the active management of Mr. McKusick, who has now got out plans for further extension of the works, that procedure having become an annual event. Mr. McKusick is no believer in the somewhat doleful forecasts for the reclaiming business indulged in by Mr. Maclaren, of the "India Rubber Journal," a year or two ago. Mr. McKusick holds the opinion that as long as rubber goods are made old material will be reclaimed and that as far as the financial side is concerned the prices of new rubber and of scrap rubber will continue their market movements in unison.

The Weber Rubber Co., Limited, of Collyhurst, Manchester, is a rubber heel manufacturing concern which has been hit by the closing of the Continental markets and is now under the management of a receiver appointed by the court. This company has not now any connection as regards proprietorship with the company called the New Turco Rubber Co., Limited.

SCIENTIFIC AND PATENT LITERATURE.

Not unnaturally under the circumstances, the last nine months have witnessed a paucity of contributions to the chemical side of our industry, and more particularly from Continental sources. With regard to synthetic rubber, if this is being made in Germany at a time when its advent there must be especially welcome the fact is unlikely to be announced to the world, while as for our own Synthetic Products Co., no doubt they are giving all their attention to the production of acetone, which is largely required in munitions manufacture. A recent paper by Dr. Stevens on the role of litharge in vulcanization is an interesting contribution to the technology of rubber. It is to be found in the "Journal of the Society of Chemical Industry" for May. The fact that sulphate of lead is to be found in goods vulcanized with sulphur and litharge was perhaps not very generally known and the analytical procedure he has devised for determining the sulphide and sulphate of lead in rubber goods forms an interesting addition to rubber analytical methods.

The "miserable secrecy" which the late Dr. Weber said characterized the works of our rubber manufacturers' laboratories is not being maintained by our largest firm, the North British Rubber Co., Limited. At the last London Rubber Exhibition the firm's chemists showed up prominently, both

in contributions of papers and in the discussions. Except in the case of the Leyland & Birmingham Rubber Co., Limited, it was noticeable that their example was not followed by other firms of importance. A further contribution from the North British company is to be found in the June 15 issue of the "Journal of the Society of Chemical Industry," in the form of a paper by Messrs. Wheatley and Porritt, describing a new machine for the preparation of vulcanized rubber for analysis. The machine is briefly an improved application of the time honored file and seems destined to give excellent service in the case of goods to which the file was applicable. With regard to raw rubber and reclaimed rubber, however, the new machine, as the authors definitely imply, leaves us much in the same position as before.

RUBBER MEN IN ACTIVE SERVICE.

Rolls of honor with the names of members who are in active service are now familiar objects in clubs, headquarters of societies, business premises, etc. To attempt any such in the case of a whole industry would prove a very formidable task, though we may yet see something done for the rubber trade on a more complete and comprehensive scale than the present casual notices of certain combatants which have appeared in the technical press. By way of adding to these scattered allusions it is with much regret that I mention the death on active service in the Dardanelles of Lieutenant Col. J. A. Fallows, of the Eighth Lancashire Fusiliers (Territorial Force). His battalion was one of the first to volunteer for foreign service and went to Egypt last September. The deceased had been connected with the Leyland & Birmingham Rubber Co., Limited, for 30 years and was well known in Manchester, having been for many years manager of the company's depot in that time. In recent years he had been entirely at the works and at the outbreak of war held the positions of commercial manager and departmental director. A memorial service held at Leyland church was attended by the directors and officials of the company, and it is superfluous to add that his loss will be keenly felt by his numerous friends in the rubber trade.

Rupert Turner, of Turner Bros., Limited, Rochdale, is attached to the Royal Army Medical Corps and has been in active service since last September in connection with ambulance work. His firm has given an ambulance car and also a repairing car for field service.

Walter Wild, late works manager of Wood Milne, Limited, is now a lieutenant attached to the First Manchester Territorials.

O. G. Moseley, of David Moseley & Sons, Limited, has taken a commission in the Earl of Chester's Yeomanry. Mr. Moseley has been well known in the hunting field and on the polo ground.

Lieut. Sath, special reserve First East Lancashire Regiment, has been awarded the Military Cross, the new distinction for service at the front. He has been wounded and invalided home on two occasions. At the outbreak of war he was chemist at the works of the Premier Waterproof & Rubber Co., Limited, of Manchester.

Second Lieut. Wallwark, whose father is well known in connection with Thomas Rowley & Co., of Manchester, has been wounded in service with the Ardwick Territorials at the Dardanelles.

Sidney Frankenburg, of the well known Salford firm, is engaged in ambulance car work with the Expeditionary Force on the Continent.

C. Frankenstein, of P. Frankenstein & Sons, Limited, of the Victoria Rubber Works, Manchester, has joined the Motor Transport Corps.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

100 YEARS IN THE NORTH BRITISH RUBBER CO. EMPLOY.

The North British Rubber Co., Limited, Castle Mills, Edinburgh, is notable, among other things, for the extreme length of time it retains its employees and the loyalty of the latter to the concern. Previous issues of this paper have noted specific instances of long periods of employment, and another has just come to our notice through the presentation of a gold watch and an illuminated address to Alexander Murray McKenzie by the management of the North British company on the occasion of his retirement, about July 1, on the completion of 42 years' service. Mr. McKenzie's father was in the employ of the company for 30 years, and other members have brought the combined services of the McKenzie family in the North British company up to a total of about 100 years.

MASTER AND SERVANT.

Under the above title "The India-Rubber Journal" of April 24, 1915, notes an interesting case upon which judgment has recently been given in the Court of Appeals, affecting the relation of master and servant, using these terms for employer and employee.

A certain draughtsman reached the position of leading draughtsman and eventually head of the selling department of an English company. On attaining this position he signed an agreement that if he left the company's employ he would not for seven years thereafter enter the employ of any other concern in the same business. This agreement he did not observe, but took service with a competitor. Action was taken by the first company to compel its former employee to observe his agreement. The trial justice rendered a decision in favor of the employee, on the ground that such an agreement was against public policy and could not be enforced. Appeal was taken against this judgment and a majority of the judges of the Court of Appeals upheld the original decision on the same ground. The law is stated as "On the one hand it was in the public interest that a covenant should be observed and enforced, but it was also in the public interest that a man should be free to use his skill and experience to the best advantage."

Doubtless such an agreement as the above is rarely required by American manufacturers in any line, although there are intimations that the signing of similar contracts has been required in the rubber trade. They would probably fail of enforcement as completely in the United States as in England if tested in the courts.

The New York Belting & Packing Co. has discontinued its London office and will transact business through the United States Rubber Co., Limited, 47 Farringdon street, London, E. C. The goods offered and the organization will remain as before.

An experimental section of rubber pavement has been laid in front of the Malay States Information office at 88 Cannon street, London. The tiles are 12 inches square and ½ inch thick, manufactured from plantation rubber.

The war has reduced the number of licensed 'buses being operated in London from 3,406 one year ago to 2,211 at the present time.

The Dunlop Rubber Co., Limited, of Birmingham, has contributed to the new British war loan to the extent of £250,000.

Waste Rubber (North Western), Limited, has been registered in London, with offices at 3 Fenchurch street, E. C., to carry on the business of manufacturing india rubber, etc. This new enterprise has a capitalization of £5,000.

THE BRITISH ARMY AND RUBBER.

THE British soldier is today pretty thoroughly waterproofed from cap to shoes. He is protected against damp and inclement weather by rubber and rainproof garments, and in rain-soaked trenches wears rubber boots or waterproof foot gear. The standard army cap covers are khaki-colored cotton cashmere of single texture proof and fashioned to be close fitting to shed water. The standard motorcycle suits are made of woolen cashmere, double texture proofed. Sometimes olive sateen is used. Trench capes that have proved to be so necessary in this modern warfare are usually made of stout twill khaki, proofed single texture. Others are made of cotton-warp cashmere and dyed cotton cashmeres, single texture proofed. Trench waders are found to be very necessary and the standard equipment is made of khaki Indianas, double texture proof similar to the proofing used in good fishing stockings. If by chance the soldier happens to be a cavalryman, he is provided with a saddle cloth made up of double-warp khaki wigan—the government standard cloth and dye, double-texture proof. For watering his horse there is a folding rubber bucket made of durable gray twills or wigans. While in camp, troughs are provided for watering the horses and are made of very heavy and strong material with good proofing. The usual fabric is double-warp wigan, double texture proof. The standard ground sheets are of khaki double-warp wigan, single texture proof. Others are made of khaki sateens and gray wigan, single and double warp. The sleeping bags are made of brown canvas duck and brown twills, proofed double texture together. The officers' mackintoshes call for a material like cotton-warp cashmere or fawn beaverteen, proofed double texture. Stout twills of double texture are sometimes specified. The officers' hold-alls are made of khaki wigans or stout twills that are proofed double texture. Stretcher cloths are of brown canvas duck or common twills double-textured together, but not very well proofed. The ambulances are protected by covers made of dyed motor-duck twills, drills, or wigans. The proofing is double texture of hard motor proofing. In some cases rainproof ducks, such as yarned, dyed ducks are used. In the hospitals where bandages and surgical dressings are necessary the white jaconet, proofed very lightly, is used for a variety of purposes, such as bandages, bed sheetings, and operating room purposes. The bed sheetings are of the number one and two qualities, bleached, usually single proofed; but sometimes they are double-texture proofed where a special sheet is desired. Another quality is made up of single-warp wigan, and still another of double-warp wigan, single-texture proofed and double-faced with white and red rubber. Batiste cloths are sometimes used in place of jaconet and bed sheetings. It has been found that batiste is better because it is cleaner and can be washed. These are usually made of scoured fine cambrics or bleached cambrics, and proofed with a very fine coating of rubber on both sides with highly polished surfaces which are soft to the touch.

EXPORTS OF RUBBER GOODS FROM AUSTRALIA.

During 1914 the State of Victoria, Australia, exported £90,917 worth of rubber manufactured goods, compared with £76,788 in 1913; showing an increase of £24,129. Of these exports, in 1914, £76,388 worth were of Australian manufacture, while in 1913 the export of rubber goods of Australian manufacture amounted to £150,531; showing for 1914 an increase in value of £25,857.

H. A. Wickham, to whose enterprise the rubber planting industry in the East owes its origin and early development, and who has held various important appointments in the service of the British government, has since the outbreak of the war become attached to the Red Cross division of the Army Service Corps.

NO TIRE SCARCITY IN FRANCE.

In commenting on the tire situation in France, the London "Commercial Motor" of May 20 contains the following paragraph: "It is evident that there is no shortage of solid and pneumatic tires in France, for the unlimited monthly contracts which were formally given to all the leading tire makers have now been withdrawn and replaced by definite orders for determined quantities of casings and bands. This implies a big reserve stock in the hands of the army authorities."

It also contains the statement that late orders for trucks have been for delivery without tires, the intention evidently being to gradually convert the inch-size tires on American trucks to millimeter standards.

RUBBER AND COTTON COMMERCE AT HAVRE, FRANCE.

Havre is the second port in importance of France and, together with Bordeaux, handles large quantities of crude rubber and rubber manufactured goods, as well as considerable quantities of raw cotton. During 1914, 11,455 metric tons (metric ton = 2,204.6 pounds) of crude and reclaimed rubber were imported through Havre, while in 1913 these exports amounted to 18,367 tons; showing a decrease of 6,911.6 tons. During 1914 Havre exported 4,978.6 tons of crude and reclaimed rubber, against 8,496.3 tons in 1913; showing a decrease of 3,517.7 tons. While the exports of manufactured rubber through this port amounted to 861 metric tons in 1913, they only amounted to 571.8 tons in 1914; marking a decrease of 289.2 tons. The war, which affected the second half of 1914, accounts for these decreases.

Havre's most important trade is in raw cotton, the imports of which for the crop year 1913-14 reached 1,075,167 bales, as compared with 1,056,000 bales imported during 1912-13. Most of this cotton was imported from the United States.

THE RUBBER TRADE WITH SPAIN.

German publications report that Great Britain's efforts to capture Germany's rubber trade in Spain have met with total failure, partly on account of the strict rules British merchants have adopted and partly for the reason that the majority of the British traveling men sent to Spain are unable to speak the language of that country. Before the war at least one-third of the rubber goods used in Spain were supplied by German merchants and manufacturers, who feel hopeful that this proportion will be re-established at the close of hostilities.

A Russian decree which became operative in March last provides for the temporary increase of rates of duty on goods imported into that country other than those coming from France, Italy and Portugal, between which countries and Russia rates of duty are fixed by treaties. Differential rates are re-introduced in respect to various classes of goods imported over the European land frontier, these being in most cases 20 per cent. higher than the corresponding rates for goods imported by sea. Rubber is included in the list of goods on which specially increased rates are charged.

The commerce in rubber shoes between the United States and Smyrna, Turkey, in 1914, consisted in the import into Smyrna of $150 worth of rubber footwear and the export of old shoes to the value of $554. In 1913 there were $1,071 worth of old shoes exported.

A new rubber sole patented in Germany is provided with a galvanized sheet iron edge, vulcanized with the sole and serving to attach it to the shoe or boot. [German patent No. 630,084.]

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Earnings of German Rubber Workers.

IT is well known that the cost of living in Germany in normal times is lower than in the United States. It is also true that German rates of wages are far below American averages. In 1913 the German Factory Workers Union investigated conditions among German rubber workers and published a comprehensive report, from which the following information was obtained:

WAGES FOR TIME AND PIECE WORK.

Both men and women are employed in German rubber factories, but at widely differing wage scales, the average wages for women being about 50 per cent. below those paid to men. Whereas the lowest wages for men recorded in the German Factory Workers Union's report were 0.26 marks (6.1 cents) per hour, paid to operators of punching machines, the lowest wages for women recorded were 15 pfennigs (3.5 cents) per hour. The highest wages paid to men, on time work, were 0.5605 marks (13.3 cents) per hour (paid to makers of electrical sundries). The highest wages paid to women were 33.5 pfennigs (8 cents) per hour.

Quite a little piece and contract work was done by both men and women workers in German rubber factories and in both cases earnings under this system were, generally speaking, somewhat higher than time wages. Less contract work was given to women than to men because, according to the report, it was found impracticable, as a rule, to have women work on contract basis.

The lowest earnings recorded for piece work for men were 0.30 marks (7.1 cents) per hour, for washers in the mechanical goods department, while the highest wages for piece work were 0.735 marks (17.5 cents) per hour, paid to men engaged in the preparation of raw rubber.

For contract work earnings ranged from 8 cents (for making conveyor and transmission belts) to 19 cents per hour, paid to polishers in high-class comb factories.

WORKING HOURS.

Working time varied considerably in the different factories, ranging from 46 to 61½ hours per week. Of the 86 factories investigated and covered by the labor union's report, only 4 worked their factory hands 60 or more hours per week, and the average time for the 27,063 men and women employed in these factories was 55½ hours per week. Twenty-nine per cent. of these workers labored more than 55½ hours per week, while 29.32 per cent. of them worked 54 hours per week, or 9 hours per day. The working time for the first five days of the week varied from 7½ to 10½ hours per day, and for Saturdays, from 4 to 10½ hours. In 25 German rubber factories work began at 6 A. M. and ended at 6 P. M. In 23 of them it began at 7 A. M., ending at 6 P. M. From 10 to 30 minutes was the average time allowed workers for breakfast, from 30 minutes to 2 hours for the noon meal and from 10 to 30 minutes was generally given for tea; this for the first 5 days of the week. On Saturdays, when working time was slightly shorter than on the other days, these recesses were also shorter.

OVER-TIME WAGES.

In 9 German rubber factories over-time was paid for at the same rates as the regular hours and was not counted until 7 P. M. One factory counted over-time from 8.15 P. M. and quite a number of factories had special over-time wages from 5 to 10 pfennigs (1 to 2 cents) higher than regular hour wages.

APPRENTICESHIPS.

The report states that work has been specialized to such an extent in German rubber factories that it is easy for men to learn their trade rapidly and many firms no longer have apprentices receiving "learners' wages." Some factories, however, continued to exact long apprenticeships during which new men worked under expert workmen. These apprentices were paid wages ranging between 8.84 marks ($2.10) and 36.00 marks (8.57) per week, but these amounts they were required to divide with their instructors, who received in some cases one-half, and in others one-third of the apprentice's pay. There were a few lines in which the apprentice was obliged to turn over his whole pay to his instructor.

HOLIDAYS.

Holidays, as a rule, are not paid for in Germany. Fourteen rubber factories of the 86 reported on, paid partial wages on holidays to workmen and workwomen who had been with them for at least three years. Three firms paid full salaries on holidays, one allowed half pay to workers three years in its employ and full pay to those who had been with it for at least five years.

DIVISION OF LABOR.

Men are employed in all branches of the German rubber industry, whereas women are employed only in certain departments. In such work as storing raw materials, washing raw rubber, drying raw rubber and the like, only men are engaged.

TABLES SHOWING WEEKLY WAGES IN GERMAN RUBBER FACTORIES.

The following tables show the minimum and maximum average weekly wages for male and female adults employed in the 86 German rubber factories reported on by the German Factory Workers Union:

WAGES PAID MEN.

Nature of Employment.	Average Weekly Wages. Minimum. Equivalent in Marks.	Minimum. Equivalent in Dollars.	Maximum. Equivalent in Marks.	Maximum. Equivalent in Dollars.
HANDLING RUBBER WASTE.				
Sorting	16.18	$3.85	22.76	$5.42
General (not classified)	22.10	5.26	24.94	5.94
PREPARATION OF CRUDE MATERIALS.				
Washing rubber	20.87	$4.97	23.70	$5.64
Drying rubber	20.68	4.92	24.72	5.88
Mixing	21.42	5.10	27.65	6.58
Calendering	25.15	5.99	31.29	7.45
General (not classified)	20.00	4.76	27.39	6.52
MAKING MECHANICAL GOODS.				
Rubber sheeting	18.96	$4.51	28.00	$6.66
Transmission and conveyor belts	20.52	4.88	31.26	7.41
Accessories	18.00	4.28	21.00	5.00
All hand work	19.62	4.67	26.95	6.41
All machine work	19.70	4.69	26.45	6.29
Hand and machine work combined	18.56	4.42	25.47	5.06
Vulcanizing	21.31	5.07	27.43	6.53
MAKING HOSE.				
Hand work	19.51	$4.64	25.77	$6.13
Machine work	19.34	4.60	25.91	6.17
Hand and machine work combined	18.61	4.43	26.06	6.20
INNER TUBES AND CASINGS.				
Automobile inner tubes	21.60	$5.14	23.80	$5.66
Automobile casings	21.11	5.02	27.92	6.65
Automobile tire repairs	23.30	5.55	27.68	6.59
Cycle inner tubes	20.05	4.77	25.96	6.18
Motor cycle casings	24.00	5.71	30.00	7.14
Solid tires	22.48	5.35	28.01	6.67
Specialists (sewing)	21.24	5.06	23.50	5.59
Vulcanizing	21.40	5.09	25.33	6.03
Finishing	18.82	4.48	23.85	5.68
General (not classified)	20.87	4.97	25.38	6.04
SURGICAL RUBBER GOODS.				
Patent rubber blocks	24.00	$5.71	28.25	$6.72
Patent rubber goods	21.62	5.15	27.68	6.59
Surgical goods	21.13	5.02	28.50	6.78
Sponges	23.00	5.47	26.67	6.35
DIPPED GOODS.				
Nipples	20.25	$4.82	25.88	$6.16
Preservatives	21.09	5.02	22.20	5.28
Miscellaneous	20.92	4.98	27.92	6.64
RUBBER ERASERS.				
General	17.33	$4.12	25.83	$6.15

BALLS, DOLLS, ANIMALS, ETC.				
General	18.75	$4.46	22.25	$5.30
RUBBER FOOTWEAR.				
General	20.17	$4.80	25.50	$6.07
PAINTED GOODS.				
Painting and coloring	20.43	$4.86	25.03	$5.96
Making up	21.00	5.00	23.00	5.47
CABLE AND INSULATED WIRE.				
General	21.90	$5.21	29.00	$6.90
MISCELLANEOUS SOFT RUBBER GOODS.				
General	19.53	$4.64	24.13	$5.74
HARD RUBBER GOODS.				
Sticks and tubes	23.71	$5.64	26.57	$6.32
Sheets and plates	24.21	5.76	27.93	6.65
Insulations for electrical goods	29.30	6.97	35.00	8.33
Mechanical and surgical goods	19.35	4.61	26.78	6.37
Vulcanizing	23.56	5.61	29.94	7.13
Grinding	18.55	4.41	24.43	5.81
Rubbing with pumice stone	16.62	3.96	22.50	5.35
Turning	21.67	5.16	28.37	6.75
Machining and threading	21.50	5.12	26.00	6.19
Polishing	19.06	4.54	23.92	5.69
Punching	14.00	3.33	24.00	5.71
COMBS.				
Grinding	16.00	$3.81	25.00	$5.95
Cutting	16.00	3.81	30.00	7.14
Wrapping	21.00	5.00	30.00	7.14
Rubbing with pumice stone	....	....	29.00	6.90
Washing and brushing	18.00	4.28	23.00	5.47
Polishing	.....	....	20.40	4.86
Finishing	18.00	4.28	24.00	5.71
Marking and gilding	17.00	4.05	25.00	5.95
Packing in tinfoil	22.00	5.24	27.00	6.43
GUTTA PERCHA GOODS.				
Preparation of raw materials	20.40	$4.86	23.46	$5.58
Making mechanical goods	20.06	4.77	27.33	6.50
STORAGE AND SHIPPING.				
Case and box makers	19.00	$4.52	28.00	$6.66
Inspectors	24.00	5.81	30.00	7.14
Freight handlers	20.39	4.85	26.45	6.29

WAGES PAID WOMEN.

Nature of Occupation—	Average Weekly Wages. Minimum. Equivalent in Marks.	Dollars.	Maximum. Equivalent in Marks.	Dollars.
HANDLING RUBBER WASTE.				
Sorting	10.75	$2.56	12.00	$2.86
Reclaiming (general)	11.00	2.62	13.00	3.09
PREPARATION OF CRUDE MATERIALS.				
Mixing	11.00	$2.62	14.30	$3.40
General	12.00	2.86	12.50	2.97
MAKING MECHANICAL GOODS.				
Plates and sheets	10.50	$2.50	15.00	$3.57
Transmission and conveyor belts	12.32	2.93	14.00	3.33
Rubber heels	9.00	2.14	12.00	2.86
Miscellaneous—				
Hand work	10.36	2.47	13.69	3.26
Machine work	10.75	2.56	14.45	3.44
Hand and machine work combined	10.06	2.39	11.99	2.85
Vulcanization of mechanical goods	10.00	2.38	12.00	2.86
MAKING HOSE.				
Hand work	9.98	$2.38	13.56	$3.23
Machine work	10.82	2.58	14.78	3.52
Hand and machine work combined	11.15	2.65	15.14	3.60
MAKING TIRES.				
Automobile inner tubes	11.88	$2.83	13.46	$3.20
Automobile casings	11.80	2.81	13.88	3.30
Reliners (tires)	11.55	2.75	13.90	3.31
Cycle inner tubes	11.72	2.79	14.20	3.38
Cycle casings—				
Sewing	12.75	3.03	14.83	3.53
Glueing	10.00	2.38	12.50	2.98
Finishing	11.40	2.71	12.40	2.95
DRUGGISTS' SUNDRIES AND SURGICAL GOODS.				
Surgical goods	11.30	$2.69	16.28	$3.87
Drugists' sundries	10.59	2.52	16.15	3.84
Rubber sponges	14.00	3.33	19.00	4.52
DIPPING GOODS.				
Nipples	9.00	$2.14	17.00	$4.05
Miscellaneous	11.62	2.77	16.67	3.97
Toy balloons and rubber jokes	11.20	2.69	13.23	3.15
RUBBER ERASERS.				
General average	11.00	$2.62	15.00	$3.57
BALLS, DOLLS, ANIMALS, ETC.				
General average	10.47	$2.49	12.48	$2.97
RUBBER FOOTWEAR.				
General average	11.70	$2.78	14.00	$3.33
MISCELLANEOUS.				
Spreading	11.12	$2.65	15.97	$3.80
Making up	11.07	2.63	15.67	3.73
Dress shields	9.00	2.14	13.50	3.21
INSULATING CABLES.				
General average	12.00	$2.86	18.00	$4.28
HARD RUBBER GOODS.				
Insulation for electrical goods	14.00	$3.33	.....	....
Mechanical and surgical goods	10.05	2.39	13.00	$3.09
Vulcanizing	9.00	2.14	11.40	2.71
Grinding	10.00	2.38	13.00	3.09
Turning	11.20	2.67	16.33	3.89
Polishing	10.71	2.55	13.47	3.21
COMBS.				
General average	10.50	$2.50	12.50	$2.98
Finishing	10.00	2.38	12.00	2.86
GUTTA PERCHA GOODS.				
Preparation of raw materials	12.00	$2.86	12.00	$2.86
Mechanical goods	10.50	2.50	12.00	2.86
WAREHOUSING AND SHIPPING.				
Box making (cardboard)	9.00	$2.14	16.00	$3.81
Inspection	11.00	2.62	14.40	3.43
Shipping	11.75	2.79	14.01	3.33

THE RUBBER TRADE IN GERMANY.

THE Germans, being a philosophical people and fond of intellectual deductions, are speculating as to what result the war will have, after it is all over and peace once more established, on rubber manufacture and other industries.

The pessimists take the attitude that the tremendous loss of men in killed and incapacitated must seriously retard German industrial progress for many years to come. The optimists, on the other hand, prophesy that with the return of peace there will begin an era of unparalleled activity in the industrial and commercial life of the Empire. They contend that they have already learned many extremely valuable lessons from the war, particularly in the direction of creating their own supply of crude materials, and thus of insuring their independence of the rest of the world. They admit that there will be an embarrassing shortage of labor, but this, they say, will result in a rapid and general improvement in mechanical devices and their more extended use. It may be that goods will cost more but they will be vastly improved in quality.

NEW GERMAN RUBBER EMBARGO.

The German Imperial Chancellor published, on June 8, a new order that supersedes all previous orders regarding rubber, gutta-percha and balata. The new order prohibits both the exportation and the transit of rubber, gutta-percha and balata, crude or manufactured, including rubber substitutes, waste and scrap rubber; rubber and gutta-percha cements, rubber oil, all goods containing either soft or hard rubber, and all soft and hard rubber articles. A proviso of the new order states that permission to export will be granted for certain goods provided it be proved that other goods containing one and one-half times as much rubber as the exported article will be imported in exchange.

TIRE STANDARDS AND WAR.

The European war has brought home to all the nations engaged in it the importance of standardization of tire sizes and the limitation of these to the smallest number possible. Germany, for instance, has discovered that seven different dimensions of automobile tires meet all requirements. Before the war at least thirty different sizes were used in the German Empire, and the German authorities report that fully 40 per cent. of the tires in stock in the country on August 1 last were found to be in odd sizes suited to only a small number of machines, the greater number of automobiles not being able to use them. Such conditions certainly call for a remedy, for they are contrary to the interests of the whole country, not only in war times, but also in time of peace. Manufacturers are obliged to make, and dealers to carry in stock, quantities of tires rarely wanted. For all this waste the consumer has to pay, and further he is often at a loss to know exactly the size he wants for his machine.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

GERMAN MILITARY USES OF MOTOR VEHICLES.

A LATE issue of the "Gummi-Zeitung" contains an interesting article on the various ways in which the motor vehicle has been put to use in German military operations. The more important points of this article are covered in the following paragraphs:

Since the outbreak of the war the manufacture of tires has been by far the most important item in the German rubber industry. The fact that Germany's isolation from the sources of supply of crude rubber has obliged the German government to prohibit the use of crude rubber for other than military purposes is largely responsible for this state of affairs, but it cannot be denied that under modern war conditions motor vehicles make the chief demand on the resources of the rubber industry. Everybody knew that automobiles and motor trucks would play an extremely important part in modern warfare, but no one could foretell the enormous demand for rubber tires this war has brought about. The tire manufacturers, however, were quick to meet the emergency and there apparently has been no shortage of this commodity that can be attributed directly to the manufacturers.

Most of the motor vehicles used in the present war are former pleasure cars of which there was a far greater number than there was of motor trucks when the war broke out. Powerful cars with large tires best answer the purposes of the belligerents and consequently this type of car is found with the armies in far greater numbers than are low powered machines. Some of these automobiles have retained the luxurious bodies they had in times of peace and are used by the general staffs. Others lost their former bodies and were fitted out with heavy armor. Others still received bodies suitable for the transportation of troops and munitions. The heavy duty imposed upon the cars by war conditions and the fact that reliability is essential has led most of the warring nations to fit those of their automobiles using pneumatic tires with dual or twin tires on the rear wheels.

The transportation of wounded and sick soldiers is perhaps the most important and most extensive service motor cars are asked to perform in the present war. Most of these motor ambulances are provided with heavy pneumatic tires with twin tires on the rear wheels. They are required to follow schedules that demand an average speed of about twenty miles an hour, and this, especially on war-worn roads, means an enormous consumption of pneumatic tires.

Motor ambulances are generally provided with seats for driver and assistant and for a few slightly wounded men, while room is left for the stretchers that bear the more severely wounded. Almost all the motor ambulances carry a first-aid pharmacy. Motorcycles with sidecars attached are also extensively used for ambulance service. These light vehicles are often able to go much nearer to the firing line than it is possible to take larger machines. Each of these motorcycle ambulances runs on three pneumatic tires and carries two or more spare tires and tubes—as do all the army motors provided with pneumatics. Many of the larger motor ambulances have trailers. These increase the carrying capacity of the motors per unit; and they also increase tire consumption owing to the fact that they themselves are equipped with two and sometimes with four tires.

The German army has even been provided with motor altars or field chapels. These are complete church altars, with all their equipment, mounted on automobiles. These motor altars have pneumatic tires, which enable them to travel rapidly from one place to another and thus multiply the services of the minister or priest using them.

Automobile searchlights play a very important part in assisting nightly movements and operations of troops. Automobile searchlights, like automobile wireless stations, are mounted on powerful cars equipped with pneumatic tires. Rubber tired automobiles carry the anti-aircraft guns, and even aeroplanes themselves are transported on motor vehicles with rubber tires. The full extent of the use of automobiles, motor trucks and rubber tires in this war will not be known until the great struggle is over.

GERMAN CRUDE RUBBER COMPANIES.

Almost all of the German crude rubber producing companies have availed themselves of a decree of the German Confederation Assembly exempting them from the obligation of presenting accounts and holding general meetings covering the year 1914. The Sapata Somoa Co., the Cameroon Rubber Co., the East African Plantations Co., and the Bismarck Archipelago Co. presented no accounts and have held no meetings. A few German plantation companies, however, have held general meetings and presented reports to their shareholders, among them the two mentioned below.

GERMAN EAST AFRICA CO.

This company reported that the outlook for 1914 was exceedingly bright until the war destroyed all the hopes of the directors. Several of the company's cargoes were seized at sea by the Allies' ships. Only one cargo of rubber and hemp was able to reach Naples. That was sent overland to Germany. The company paid no dividends.

MEANJA RUBBER PLANTATION CO.

The Meanja company, Berlin and the Cameroons, stated that on November 14 all the German employees on the company's plantations were seized by the British and French forces, together with two-thirds of the 1914 crop. The Imperial Colonial Secretary had promised to indemnify the company for its losses. No dividend was paid by this company, which for 1913 paid a cash dividend of 5 per cent.

DEVELOPMENT OF RUBBER PLANTATIONS ON THE EAST COAST OF SUMATRA.

A report published by the Chamber of Commerce of Medan, Sumatra, states that on January 1, 1915, the total area under *Hevea* in the districts of the east coast of Sumatra amounted to 245,000 acres, of which 55,000 were producing. In 1902 the area planted in *Hevea* in these districts amounted to 435 acres; in 1905, there were 5,110 acres; in 1910, 73,826 acres, and by 1914, 245,000 acres on the east coast of Sumatra were planted in *Hevea*. The following table shows the kinds and quantities of crude rubber exported from the east coast of Sumatra during 1913 and 1914, also the increase or decrease in these exports:

	1913.	1914.	+ = Increase. — = Decrease.
Hevea ..... *pounds*	6,561,687	10,672,996	+ 4,111,309
Ficus and other.....	981,455	839,978	— 141,477
Wild rubber	30,153	22,433	— 7,720
Total	7,573,295	11,535,407	+ 3,962,112

No statistics are at present available regarding the destination of the above exports, but the following table shows the destination, quantities, increase and decrease of crude rubber exports from the port of Bilah, east coast of Sumatra, during the years 1913 and 1914.

To	1913.	1914.	+ = Increase. — = Decrease.
Holland ..... *pounds*	1,001,863	985,747	— 76,746
England	3,743,181	5,531,813	+ 1,788,632
Germany	61,470	59,731	— 2,767
Belgium	266,310	150,341	— 115,969
United States	130,753	782,030	+ 651,277
France	17,653	26,050	+ 8,397
Total	5,221,230	7,535,712	+ 2,314,482

In a recent issue the "Times of Ceylon" comments on a form of rubber stealing that has become serious in certain producing districts, the trees being tapped over night and the latex carried away, as many as 500 trees sometimes being illicitly tapped in a single night.

PLANTATION RUBBER'S VULCANIZING CAPACITY.

By Our Eastern Correspondent.

AS a result of experimental work carried out in the vulcanizing and testing laboratory established not long ago in Malaya by the Agricultural Department of the Federated Malay States, B. J. Eaton and J. Grantham have arrived at certain important conclusions on the subject of variability of plantation rubber, which have been embodied in a paper recently published in the "Agricultural Bulletin."

They point out that during the last two or three years much has been written and many statements made concerning variation in plantation Pará rubber. The opinions expressed generally by manufacturers are to the effect that variation is considerable, even in the case of "first latex" rubbers when compared with fine hard Pará as the highest grade of wild Pará rubber. On the other hand, leading rubber technologists and chemists have maintained that the best grades of plantation Pará rubber, especially sheet, are superior to fine hard Pará. According to Eaton and Grantham both opinions may be taken as correct and are not necessarily contradictory. Unfortunately, neither the statements made by manufacturers nor the published results of experiments carried out by rubber chemists have indicated the nature of this variation; still less have any published results enabled us to attribute this variation to any definite cause.

It is particularly noteworthy that Eaton and Grantham combat the familiar notion that variability refers only to those properties of rubber which may be tested by physical means. The general assumption, they state, that variation refers to differences in the mechanical properties of the raw or vulcanized rubber, i. e., strength, elasticity, etc., is only true to a limited extent among "first latex" rubbers and represents only a part of such variation.

It is claimed by the authors of the paper that these experimental results are the first, so far as the writers are aware, which have indicated the most important variation in plantation Pará rubber, namely, its variable vulcanizing capacity.

Importance is also attached to the fact that the authors were acquainted with the entire history of their samples—a condition impossible of realization to chemists and scientists resident in Europe.

SUMMARY OF RESULTS.

According to the summarized results given at the conclusion of the paper, it is found that considerable variation occurs in plantation Pará rubbers, both from the same estates and from different estates. This variation is connected principally with the behavior of the rubber on vulcanization, i. e., its rate of cure, and not in respect to its strength, elasticity and general mechanical properties; especially in the case of properly prepared "first latex" samples. If the rate of cure be known or ascertained under specific conditions, vulcanized rubber, having similar mechanical properties, can be made from all good samples of "first latex" rubbers. The differences in mechanical properties are not so important to the manufacturer as the differences in rate of cure and are not of the same order. The rate of cure is due to the presence of some non-caoutchouc substance in the latex, possibly the proteins or some other constituent. This substance may be already present in the latex, and its amount in the raw rubber determined by the mode of preparation and coagulation, or it may be subsequently formed in the latex by decomposition, or it may be formed in the coagulum. The alternative theories await investigation.

Another of the conclusions arrived at appears to be worthy of special note: "The rate of cure of a rubber under specified conditions is not indicated in any way by the apparent mechanical, or any other apparent properties of the raw material; hence the absurdity of the present methods of valuation of rubber. A manufacturer probably prefers a rapidly curing rubber, as it represents economy in heat, labor and time costs; and secondly, a rubber which cures rapidly is said to have better keeping qualities under vulcanization. Rapidly curing samples should therefore obtain a premium in the market and probably would if valuation were carried out on a scientific basis, provided uniformity in rate of cure be maintained at the same time."

It is thought that uniformity between "first latex" rubbers from different estates will be very difficult of attainment with present methods, but should not be difficult of solution among such rubbers from the same estate. Two alternatives are suggested: (*a*) the issue of certificates giving the correct rate of cure and the mechanical properties at this cure; and (*b*) the attainment of more uniformity by a method in which rubber from latex collected during a series of days forms part of one ball or block, which may be described as the method of averages.

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram from Singapore announces that the export of plantation rubber from the Straits Settlements ports durin the month of June amounted to 2,249 tons, as compared with 3,588 tons in May and 1,480 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913.	1914.	1915.
January .....*tons*	784	1,181	2,576
February	743	1,703	2,741
March	898	1,285	2,477
April	762	1,548	1,978
May	814	1,309	3,588
June	812	1,480	2,249
Total	4,813	8,506	15,609

These figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORT.

An official cablegram received from Kuala Lumpur announces that the export of plantation rubber from the Federated Malay States during the month of June amounted to 3,403 tons as compared with 2,708 tons in May last and 2,306 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913.	1914.	1915.
January .....*tons*	2,131	2,542	3,473
February	1,757	2,364	3,411
March	1,737	2,418	3,418
April	1,626	2,151	2,777
May	1,225	2,069	2,708
June	2,005	2,306	3,403
Total	10,481	13,850	19,190

EXPORTS OF RUBBER AND COTTON FROM FRENCH INDO-CHINA.

During 1914 exports of crude rubber from French Indo-China amounted to 397,522 pounds as compared with 338,589 pounds exported during the previous year; showing an increase of 58,933 pounds. Of these total exports of crude rubber 297,161 pounds of plantation rubber and 792 pounds of wild rubber were shipped to France, and 100,283 pounds of plantation rubber were shipped to Singapore.

The total exports of cotton amounted to 10,024,978 pounds in 1914, as compared with 18,482,471 pounds in 1913; showing a decrease of 8,457,493 pounds.

Exports of rubber from French West Africa have fallen off during the past few years, amounting in 1913 to only $3,049,555, as against $5,064,000 in 1912 and $5,852,000 in 1911. Rubber is prohibited export from this district in any other form than thin slabs, and in order to encourage commerce in this product the government has recently lowered the export duty.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED JUNE 15, 1915.

NO. 1,142,892. Resilient tire. A. B. Landis, Enfield, Pa.
1,142,905. Tire casing. W. G. Morris, Morrill, Nebr.
1,142,911. Fountain brush. G. Riddiford, Chicago, Ill.
1,142,945. Balloon stripping machine. B. V. Edwards, assignor to Edwards Engineering & Manufacturing Co.—both of Newark, N. J.
1,142,985. Vehicle wheel with pneumatic tire. J. Schies, Anderson, Ind.
1,143,031. Detachable rim for pneumatic tires. B. Bradford, Norristown, assignor to Lee Tire & Rubber Co., Conshohocken—both in Pennsylvania.
1,143,046. Draining device for embalming purposes. W. E. Gilmore, Holmesville, Ohio.
1,143,102. Tire for vehicle wheels. J. Cairns, Willenhall, South Staffs, England.
1,143,124. Tire tread. A. Kanzee, San Francisco, Cal.
1,143,139. Wheel tire. I. H. Riley, Osceola, Iowa.
1,143,141. Tire plug. L. V. Rood, Marietta, Ohio.
1,143,180. Resilient wheel comprising pneumatic tire. J. L. Firm, Berwyn, Ill.
1,143,265. Armoring pneumatic tire. C. M. Gautier, Putney, London, England.
1,143,341. Combination bathing cap and protecting device for the hair. E. E. Whittaker, Milwaukee, Wis.
1,143,419. Slip-on inking roller. D. A. McKenna, Brooklyn, N. Y.
1,143,451. Fountain shaving brush. A. W. Skowbo, Armstrong, Iowa.
1,143,458. Smoking doll. S. W. Stern, New York, N. Y.
1,143,461. Tire. R. E. Sturman, Franklin township, Wright county, Minn.
1,143,502. Eyeglass protector. I. G. Burton, Asbury Park, N. J.
1,143,506. Hose supporter. G. H. Chandlee, Washington, D. C.
1,143,565. Pneumatic wheel. W. Alexandrowsky and A. Slobinski, Petrograd, Russia.

Re-Issue.

13,928. Flexible dress overshoe. C. L. K. Ferguson, Philadephia, Pa.

Design.

47,467. Tire tread. W. D. McNaull, Toledo, Ohio.

ISSUED JUNE 22, 1915.

1,143,781. Pneumatic tire. G. H. Quennard, Allendale, N. J.
1,143,808. Amusement device. W. B. Choate, Aurora, Ill.
1,143,835. Life saving apparatus for aeronauts. M. Kispeter, New York, N. Y.
1,143,944. Corset with elastic strips inset. S. F. Colman, New York, N. Y.
1,143,982. Tire for vehicles. W. R. Meredith, Youngstown, Ohio.
1,144,045. Machine for punching rubber nipples. J. L. Mahoney, New Haven, Conn.
1,144,079. Tubular cord for tire casings. J. D. Tew, Akron, Ohio.
1,144,085. Exercising apparatus for use in a lying position. A. Abplanalp, Basel, Switzerland.
1,144,121. Bathing cap. E. A. Guinzburg, New York, N. Y.
1,144,134. Rubber tired cycle skate. J. D. Jones, assignor of one-half to R. G. Warnick, and one-half to C. E. Buckwalter—all of Long Beach, Cal.
1,144,239. Inner tube for pneumatic tires. J. H. Poole, Avon, assignor to Reinforced Inner Tube Co., Brockton—both in Massachusetts.

Re-Issue.

13,939. Suspenders. S. Martin, Cliftondale, Mass.

Design.

47,486. Garter. G. B. Glidden, Dighton, assignor to George Frost Co., Boston—both in Massachusetts.

ISSUED JUNE 29, 1915.

1,144,346. Teat cup. L. Bull, Chicago, Ill.
1,144,420. Process of making welt inner soles. W. A. Knipe, Ward Hill, Mass.
1,144,429. Machine for cutting forms. E. L. Patten, Malden, assignor to Wellman Co., Medford—both in Massachusetts.
1,144,436. Self filler fountain pen. J. L. Schnell, Arlington, N. J.
1,144,631. Waterproof diaper. N. M. Barlet, assignor to the Junoform Co. —both of Philadelphia, Pa.
1,144,671. Core for manufacture of pneumatic tire casings. P. E. Welton, assignor to K. B. Welton—both of Akron, Ohio.
1,144,682. Horse collar. J. J. Baarson and A. T. Thorson—both of Odin, Minn.
1,144,683. Vulcanizer. B. R. Barder, Akron, Ohio.
1,144,716. Braiding machine. J. Lundgren, assignor to The Carlson-Wenstrom Manufacturing Co., Inc.—both of Philadelphia, Pa.
1,144,747. Golf tee. H. Abert, assignor to The Manhattan Rubber Manufacturing Co.—both of Passaic, N. J.
1,144,802. Doctor for calendering machines. T. E. Warren, Ticonderoga, N. Y.
1,144,812. Freely portable breathing apparatus. F. L. Claren, assignor to Drägerwerk, Heinr. & Bernh. Dräger—both of Lübeck, Germany.
1,144,959. Pneumatic tire. M. A. Dees, assignor to The American Tire Co.—both of St. Louis, Mo.
1,144,980. Nipple for nursing bottle. E. C. Hilton, Andover, assignor to Tyer Rubber Co., Boston—both in Massachusetts.

ISSUED JULY 6, 1915.

1,145,034. Resilient wheel comprising rubber blocks. J. Reuse and C. Reuse, Hal, Belgium.
1,145,052. Stamp canceling device. J. E. Ball, Syracuse, N. Y.
1,145,063. Tire. J. E. Hale, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,145,351. Treatment of latex and the extraction of india rubber therefrom. S. C. Davidson, Belfast, Ireland.
1,145,352. Extraction or coagulation of india rubber from the latex. S. C. Davidson, Belfast, Ireland.
1,145,433. Vulcanizing flask for dentists. W. E. Pappert, New York, N. Y.
1,145,446. Automatic machine for making tubular fabric. L. A. Subers, Cleveland, Ohio.
1,145,472. Fountain pen barrel. W. L. Durland, New York, N. Y.
1,145,520. Vaginal powder sprayer. J. W. Smith, Three Rivers, Mich.
1,145,532. Hose attaching device. G. H. Webb, Skowhegan, Me.
1,145,533. Arch supporter. W. O. Wetmore, Washington, D. C.
1,145,534. Arch supporter. W. O. Wetmore, Washington, D. C.
1,145,580. Tire structure. A. H. Garrison, Davisburg, Mich.
1,145,657. Fountain pen. F. M. Ashley, New York, N. Y.
1,145,687. Water bag or bottle. I. F. Kepler, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
1,145,741. Detachable pneumatic tire. L. B. Bernheim, Louisville, Ky.
1,145,758. Detachable fitting for syringes. A. E. Dupell, New York, N. Y.

ISSUED JULY, 13, 1915.

1,145,876. Tire grip. O. Bahls, New York, N. Y.
1,145,993. Construction for pneumatic tires. S. A. Hunter, Newton, Kans.
1,145,996. Cementing machine. G. J. Julian, Beverly, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.
1,146,088. Sole and heel for boots and shoes. G. W. Murphy, Indianapolis, Ind.
1,146,253. Production of caoutchouc from isoprene. A. Heinemann, South Kensington, London, Eng.
1,146,350. Life preserving suit. D. Sabo, assignor of one-half to M. Kocez—both of Bridgeport, Conn.
1,146,381. Pneumatic tire. T. H. Young, Salt Lake City, Utah.
1,146,424. Vulcanizer. W. P. Graves, M. J. Frambach and L. A. Graves —all of Melvin, Iowa.
1,146,430. Cap for fountain syringes or the like. H. P. Kraft, New York, N. Y., and M. C. Schweinert, West Hoboken, N. J.
1,146,538. Tire vulcanizer. W. G. Vandegrift, Camp Hill, assignor of one-half to W. Albright, Harrisburg—both in Pennsylvania.
1,146,584. Teat cup. A. C. Macartney, assignor to Empire Cream Separator Co.—both of Bloomfield, N. J.
1,146,638. Process of manufacturing seamless rubber gloves. T. W. Miller, assignor to The Faultless Rubber Co.—both of Ashland, Ohio.
1,146,639. Nursing bottle nipple. T. W. Miller, assignor to The Faultless Rubber Co.—both of Ashland, Ohio.
1,146,640. Reed for toys. T. W. Miller, assignor to The Faultless Rubber Co.—both of Ashland, Ohio.
1,146,646. Lathering implement. T. G. Morgan, Shamokin, Pa.
1,146,699. Process of manufacturing continuous lengths of vulcanized rubber combined with ebonite. T. Gare, Birmingham, England.
1,146,708. Spring tire. H. W. Hooton and S. A. Duggins—both of Salt Lake City, Utah.
1,146,741. Process of securing neck closures in hot water bottles. B. F. Stauffer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
1,146,747. Automobile tire. J. T. Baker, Los Angeles, Cal.

Re-Issue.

13,945. Weather strip for automobile wind shields. A. L. McCormick, Kansas City, Mo.

UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1914.
**Denotes Patents for American Inventions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 16, 1915.]

4,139 (1914). Rubber heel pad. G. Cummings, Bleak House, Gosforth, Northumberland.
4,263 (1914). Vulcanizing india rubber. S. J. Peachey, 8, Halesden Road, Heaton Chapel, Stockport.
4,283 (1914). Tire vulcanizer. H. C. Reading & Co., Burton Motor Garage, High street, and G. E. Sutton, 88, Belvedere Road—both of Burton-on-Trent.
4,293 (1914). Repairing rubber articles. S. Wilson, Robsart street, Parkside, South Australia.
4,313 (1914). Tire vulcanizer. W. H. Miles, Woolpack Hotel, Langton, Staffordshire.
4,423 (1914). Bottle stopper. G. A. Schulz, 11, Grosse Kirchstrasse, Grunberg, Silesia, Germany.
4,451 (1914). Emulsion formed as an intermediate caoutchouc product. Frankel & M. Runge, 19, Lazarusstrasse, and W. Golombek, 33, Klosterstrasse—both in Spandau, Germany.

4,457 (1914). Wind screen for vehicles. E. Faber, 49, Barbarossastrasse, Berlin.

*4,557 (1914). Thermometer case. O. Gray, Little Rock, Ark., U. S. A.

4,570 (1914). Wheel tire. M. W. Fink, "Melrose," St. Kilda street, Middle Brighton, and A. M. Kobiolke, 18, Gordon avenue, Kew—both near Melbourne, Australia.

*4,623 (1914). Molding hollow rubber articles. R. H. Rosenfeld, Cleveland, Ohio, and F. T. Roberts, Trenton, N. J.—both in U. S. A.

*4,683 (1914). Vehicle wheel. E. Z. Crow, 1012 Avenue K, Birmingham, Ala., U. S. A.

*4,694 (1914). Vehicle wheel. J. W. Leonard, Cedarcliff, New York, U. S. A.

4,745 (1914). Winding webs, wire, etc. W. Player, 54, Calthorpe street, Egbaston, and W. Brace, 327, High street, Smethwick, Birmingham.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 23, 1915.]

4,889 (1914). Telescope in which the body portion is of rubber. E. Reif, Görz, Austria.

4,955 (1914).. Rubber coated fabrics. W. E. Muntz, 6, Breams Buildings, Chancery Lane, London.

5,017 (1914). Non-slipping shoe tread. A. Thill, 150 Boulevard Anspach, Brussels.

5,113 (1914). Rubber in moisture absorbing appliances for pianos, etc. C. F. Killar, 4, Holly Village, Swains Lane, Highgate, London.

5,129 (1914). Apparatus for closing tire punctures. W. G. Windham, 30, Evelyn Gardens, London.

5,259 (1914). Gaiters for supporting an air tube at a weak part of the cover. J. T. McGuire, 140, Stanhope street, Newcastle-on-Tyne.

5,299 (1914). Rubber heel pad. J. Giraud, 16, Rue Saint Ferréol, Marseilles, France.

5,464 (1914). Rubber belting and packing machine. P. M. Matthew, Victoria Rubber Mills, Edinburgh.

5,461 (1914). Air tubes and chambers for wheel tires. H. Mustière, 4, Boulevard Pereire, Paris.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 30, 1915.]

5,571 (1914). Necktie, stiffened by rubber strips. W. Hey, 6 Grimstone Terrace, Hull Road, York.

5,633 (1914). India rubber substitutes; coated and compound fabrics. Akt.-Ges. fur Anilin Fabrikation, Treptow, near Berlin.

5,746 (1914). Breathing apparatus. A. B. Dräger, 53 Moislinger Allee, Lubeck, Germany.

5,809 (1914). Elastic bandage. L. H. Shortle, 8 Green Road, Southsea, Hants.

5,948 (1914). Necktie. J. G. Frame and J. A. Sword, 472 Bathurst street, Toronto, Ont., Canada.

*5,962 (1914). Tire rim. P. B. Bosworth, 645 Summer street, Akron, Ohio, U. S. A.

*5,963 (1914). Tire rim. P. B. Bosworth, 645 Summer street, Akron, Ohio, U. S. A.

*6,063 (1914). Cutting tires. A. Greenwell and F. W. Rembold, Owensboro, Ky., U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 7, 1915.]

6,114 (1914). Wheel tire. J. E. Serste, 83 Rue de Wautier, Laeken-Brussels.

6,185 (1914). Rubber sleeve for vehicle window weather bars. M. Ritter, 10 Canalettostrasse, Dresden, Germany.

*6,203 (1914) Rubber protectors for footwear. J. G. Tufford, 1217 East avenue, Elyria, Ohio, U. S. A.

6,215 (1914). Coagulating rubber latex. A. Woosnam, 10 New Court, Lincoln's Inn, London.

6,216 (1914). Cementing press for footwear. Continental Caoutchouc und Gutta Percha Cie, Hanover, Germany.

6,237 (1914). Wheel tire. C. H. May, 30 John Bright street, Birmingham.

6,259 (1914). Vehicle wheel with rubber tread. F. W. Brown, City Chambers, Clifford street, York.

6,271 (1914). Boots, etc. L. Kropf, Villa Bayer, Karlsbad, Austria.

6,290 (1914). Vehicle wheel; spring. E. Murray, 62a Queen's Road, Bayswater, London.

6,299 (1914). Rubber or rubber-faced wheel guard and obstruction remover. H. Conrad, 19 Ebbsfleet Road, Cricklewood, London.

6,328 (1914). Regenerating air for breathing. A. B. Dräger, 53 Moislinger Allee, Lubeck, Germany.

6,407 (1914). Rubber covered playing bowl. J. D. Watson, 80 Churchill Road, Great Yarmouth, Norfolk.

6,418 (1914). Electric condenser. Allgemeine Elektricitäts Ges., 2 Friedrich Karl Ufer, Berlin.

6,457 (1914). Bottle stopper. E. de Wit, 110 Avenue des Petits-Coqs, Antwerp, Belgium.

6,470 (1914). Knitting machine for elastic stockings. C. Claringburn, 194 Noel street, Hyson Green, Nottingham.

6,489 (1914). Inkstand. M. J. Webb, Carmel House, St. Alphonsus Road, Drumcondra, Dublin.

6,517 (1914). Wheel tire. R. I. Henderson, 399 Markham street, Toronto, Ont., Canada.

6,599 (1914). Wheel tire. R. I. Henderson, 399 Markham street, Toronto, Ont., Canada.

6,640 (1914). Wheel tire. H. Wippel, 29 Tiedexerstrasse, Einbeck, near Hannover, and Reform-Pneumatik "System Wippel" Ges., Hannover, Germany.

NEW ZEALAND.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, JUNE 10, 1915.]

35,766 (1915). Expressing oil juice or fluid from seeds, and materials and substances generally which contain oil juice, juice or fluid; also adapted for producing shaped blocks or pieces from plastic materials, etc. J. T. Hunter, 157, Featherston street, Wellington, New Zealand.

36,073 (1915). Garter. E. H. Reid, "Chaldon Hill," Ellinbank, Victoria.

THE FRENCH REPUBLIC.

Patents Issued (with Dates of Application).

475,120 (January 20, 1914). Process and arrangement for manufacturing rubber bulbs with neck, in one piece, on a hard mandrel. Société Française de Caoutchouc, Montsouris.

475,164 (June 16). Rubber tire for vehicle wheels. H. B. Gillette.

475,251 (July 17). Detachable rim for solid rubber tires. M. Polack.

475,351 (February 11). Improved non-inflammable plastic substances. Compagnie Générale des Établissements Pathé Frères.

475,366 (February 14). Metallo-plastic packing and process for manufacturing same. M. Varinois.

475,405 (May 25). Improvements to automobile and other wheels. E. F. Goodyear.

475,438 (February 21). Method for manufacturing a ring, band or bracelet with diagonal threads, for pneumatic tires. E. Bourdin.

475,452 (July 20). Elastic wheel. Smith Spring Wheel Co.

475,504 (July 21). Process for manufacturing an elastic substance to be used in the making up of bandages and other articles. Barricelli.

475,506 (July 21). System for fixing rubber rings to pneumatic tire and other valves. Schrader's Sons, Incorporated.

475,541 (July 22). Improved detachable rims. Lightning Lock Demountable Rim Co.

[NOTE.—Printed copies of specifications of French patents can be obtained from R. Bobet, Ingénieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

285,138 (October 12, 1912). Process for manufacturing waterproof cloth and other materials. Frank E. Barrows, Washington, D. C., U. S. A.

285,745 (February 1, 1914). Injector. Dr. Charles A. Tyrrell, New York, N. Y., U. S. A.

286,118 (June 19, 1911). Method for correcting flaws in rubber goods. Wilhelm G. Rudolph, Frankfort-on-the-Main.

286,260 (January 26.) Balloon fabric. Metzeler & Co., Munich.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THE continued uncertainty of the supply of imported raw materials used in the manufacture of rubber chemicals and ingredients has had a disturbing influence on the July market. Metal lead was steady during the early part of the month and zinc oxide has not recorded any more remarkable changes. The price of lithopone was firm and considerable foreign stock was offered to the trade. As the month progressed the situation did not improve from the buyer's standpoint.

Some competition was noticed in barytes, caused by the offering of samples from Australia. Just how much competition that country can offer remains to be seen. The supplies of chalk are not sufficient to ease the market to any extent and whiting is consequently very firm in price. China clay is likely to go to higher figures on account of unfavorable shipping conditions. By the end of the month, market conditions had not changed as far as lead and zinc pigments were concerned. Several of the dry colors were difficult to obtain and the shipping situation continues to be a large factor in supplies that depend upon imported foreign materials.

The cost of acetate of lime has resulted in an advance in acetone, and in spite of the absolute embargo placed on glycerine by Great Britain the price remains unchanged. Acetic acid is in demand for export and the domestic market is firm with prices slightly higher in sympathy with the high prices of acetate of lime. It is reported that aniline oil is becoming difficult to obtain and the spot supply has been drawn on heavily during the past few weeks. The benzol situation seems to be easier and if the new plants which are being erected for the manufacture of this by-product are successful a new competitor for gasolene as a motor spirit will have been created.

It is evident from government statistics that drug supplies are at the lowest point in the history of the trade. This is shown

by the depleted stocks held in bonded warehouses at the end of May.

The production of sulphur in the United States in 1914 was the greatest in the history of the sulphur industry. According to the United States Geological Survey there was 327,634 long tons produced, valued at $5,954,236.

A protest made by New York importers who claimed that calcined magnesia should have been returned by the appraiser as a chemical compound carrying 15 per cent. ad valorem, has been overruled.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.
NEW YORK, JULY 30, 1915.

Acetone (drums)	lb.	$0.22	@
Acid, acetic, 28 per cent. (bbls.)	lb.	2.50	@ 2.65
glacial (carboys)	lb.	.10½	@ .11
Aluminum Flake (carloads)	ton	18.00	@ 20.00
Ammonium carbonate		None	
Antimony, crimson, sulphuret of (casks)	lb.	.85	@ .90
golden, sulphuret of (casks)	lb.	.60	@ .70
Asbestine	ton	19.00	@ 20.00
Asbestos	lb.	.04	@ .05
Asphaltum "G" Brilliant	lb.	.03	@
Barium sulphate, precipitated	ton	65.00	@
Barytes, pure white	ton	18.75	@ 22.50
off color	ton	15.50	@ 17.75
Basofor	ton	75.00	@
Benzol, 90 per cent.	gal.	.90	@ 1.00
Beta-Naphthol	lb.	2.00	@ 2.50
Black Hypo	lb.	.25	@
Blanc Fixe	lb.	.04	@ .04½
Bone ash	lb.	.06½	@
black	lb.	.06	@
Cadmium tri-sulphate		None	
yellow		None	
Carbon bisulphide (drums)	lb.	.07	@
black (cases), Boston	lb.	.07	@
tetrachloride (drums)	lb.	.18	@
Caustic soda, 76 per cent. (bbls.)	cwt.	2.25	@ 2.50
Chalk, precipitated, extra light	lb.	.04	@ .04½
China clay, domestic	ton	9.00	@ 15.00
imported	ton	16.00	@ 35.00
Chrome, green	lb.	.08	@ .10
yellow	lb.	.13	@ .14½
Cotton linters	lb.	.05	@
Di-chlorethane (drums)	lb.	.12	@ .12½
Emarex	ton	70.00	@
Gas black	lb.	.05½	@ .06½
Gilsonite	ton	37.50	@ 42.50
Glycerine, C. P. (drums)	lb.	.23	@
Graphite, flake (250 to 400 pound bbl.)	lb.	.14	@
powdered (250 to 400 pound bbl)	lb.	.05	@
Green oxide of chromium (casks)	lb.	.30	@ .33
Ground glass	lb.	.03	@
Iron oxide, red, reduced grades	lb.	.02	@ .07
red, pure	lb.	.07	@ .12
Infusorial earth, powdered	ton	50.00	@
bolted	ton	60.00	@
Ivory, black	lb.	.08	@ .12
Indian red	lb.	.02½	@ .05½
Lampblack	lb.	.04	@ .08
Lead, red oxide of	lb.	.07½	@
sublimed blue	lb.	.06½	@
white, basic carbonate	lb.	.06¾	@
white, basic sulphate	lb.	.06½	@
Lime, flour	lb.	.01	@ .01½
hydrated	lb.	.01	@ .02
Litharge	lb.	.07	@ .07½
English	lb.	.10	@ .11
Lithopone, domestic	lb.	.08	@
imported	lb.	None	
Magnesia, carbonate	lb.	.04¼	@ .05½
calcined, heavy	lb.	.06¾	@ .09¾
light	lb.	.20	@ .25
Magnesite, calcined, powdered	ton	36.00	@
Mica, powdered	lb.	.03½	@ .05
Mineral rubber	lb.	.01¾	@ .04½
Naphtha, stove gasolene (steel bbls.)	gal.	.14	@
66@68 degrees	gal.	.18	@
68@70 degrees	gal.	.19	@
Oil, aniline	lb.	1.30	@ 1.50
corn, crude	lb.	.06½	@ .06¾
linseed (bbl.)	gal.	.57	@ .58
paraffine (cases), Boston	gal.	.22	@
pine (cases) Boston	gal.	.45	@
rosin, heavy body	gal.	.25	@ .55
tar (cases) Boston	gal.	.24	@
Orange mineral, domestic	lb.	.09¼	@
Paragol	lb.	.06	@
Petroleum grease	lb.	.03	@
Pine tar, Boston	gal.	.14	@
Pitch, burgundy	lb.	.03½	@ .05
pine, Boston	cwt.	1.75	@
Plaster of paris	cwt.	.75	@ .80
Prussian blue	lb.	.95	@ 1.05
Pumice stone, powdered (bbls.)	lb.	.02	@ .03
Rosin (280 and 500 pound bbls.)	lb.	3.70	@ 7.50
Rotten stone, powdered	lb.	.02½	@
Rubber black	lb.	.02½	@ .03
Rubber flux	lb.	.06	@
Rubber substitute, black	lb.	.06	@ .07½
white	lb.	.07½	@ .15
Shellac, fine orange	lb.	.22	@ .25
Soapstone, powdered	ton	8.50	@ 20.00
Starch, corn, powdered	lb.	.02½	@
Sulphur chloride (drums))	lb.	.06½	@ .07½
Sulphur, flowers	cwt.	2.00	@
Sulphuric acid	lb.	1.25	@ 2.00
Talc, American	ton	12.00	@
French	ton	21.00	@
Toluol, pure	gal.	2.50	@ 3.00
Tripolite earth, powdered	ton	50.00	@
bolted	ton	60.00	@
Turpentine, pure gum spirits	gal.	.44	@ .45½
wood, Boston	gal.	.38	@
Ultramarine, blue	lb.	.05	@ .16
Vermilion, brilliant	lb.	.90	@
Chinese	lb.	.95	@ 1.00
English	lb.	1.35	@ 1.50
Wax, bayberry	lb.	.22	@ .24
beeswax, white	lb.	.40	@ .55
ceresin, white	lb.	.12	@ .27
carnauba	lb.	.23	@ .45
Ozokerite, refined white	lb.	.55	@ .60
montan	lb.	.25	@
Paraffine, refined, 118/120 m. p. (cases)	lb.	.03¾	@
123/125 m. p. (cases)	lb.	.04	@
128/130 m. p. (cases)	lb.	.04¼	@
133/136 m. p. (cases)	lb.	.06	@
crude, white, 117/119 m. p. (bbls.)	lb.	.03½	@
yellow 124/126 m. p. (bbls.)	lb.	.03½	@
Whiting, alba, factory	ton	6.50	@ 7.50
commercial	cwt.	.45	@ .55
gilders	cwt.	.55	@ .65
Paris white, American	cwt.	.70	@ .75
English cliffstone	cwt.	.90	@ 1.25
Wood alcohol	gal.	.47	@
Yellow ocher	lb.	.02⅛	@ .03½
Zinc oxide, American process (factory) horse head.	lb.	.08¼	@
"special"	lb.	.07¾	@
"XX special"	lb.	.30⅝	@
French process, green seal	lb	.30⅛	@
red seal	lb.	.31⅛	@
white seal	lb.	.06¼	@ .06½
Zinc sulphide	lb.		

EXPORTS OF CHEMICALS AND COMPOUNDING INGREDIENTS.

From May 28 to July 18 inclusive, the following chemicals and compounding ingredients were exported from the Port of New York:

Destination.	Quantity.	Material.	Value.
Great Britain	1,055 packages	White lead	$42,306
France	88 packages	White lead	2,629
Spain	20 barrels	White lead	578
Great Britain	6,055 barrels	Oxide of zinc	69,615
France	50,466 pounds	Toluol	28,958
Great Britain	215 barrels	Bone black	2,815
Russia	112,041 pounds	Carbonate of magnesia	6,655
Great Britain	134 drums	Acetone	18,255
Russia	45 barrels	Sulphur	228
Great Britain	300 barrels	Rosin	4,070
Italy	500 barrels	Rosin	4,956
Holland	3,670 barrels	Rosin	13,000
Holland	5,745 bags	Acetate of lime	26,155
Spain	1,537 bags	Acetate of lime	6,650
Denmark	720 bags	Acetate of lime	3,330
England	440,236 pounds	Acetic acid	23,726
France	15,897 pounds	Acetic acid	1,202
Norway	70 cases	Carbon black	813
Spain	23 barrels	Carbon black	171
Denmark		Carbon black	1,500
France	251,191 pounds	Benzol	22,343
England	280 barrels	Lithopone	4,480
England	55 barrels	Petrolatum	1,359
England	956,284 pounds	Paraffine wax	74,075
Switzerland	26,354 pounds	Paraffine wax	686
Sweden	12,831 pounds	Paraffine wax	612
Holland	1,196,842 pounds	Paraffine wax	6,227
Italy	2,124,628 pounds	Paraffine wax	70,511
Portugal	25,059 pounds	Paraffine wax	8,701
France	541,803 pounds	Paraffine wax	17,250
Denmark	7,068 pounds	Paraffine wax	333
Spain	1,430,584 pounds	Paraffine wax	92,956

The United States exported 34,017,166 pounds of zinc oxide, valued at $1,631,853, during the eleven months ending May, 1915, against 26,096,954 pounds, valued at $1,084,907, for the same period in 1914.

THE MARKET FOR COTTON AND OTHER FABRICS.

THE question of placing cotton on the contraband list is being vigorously agitated by the British press. The British government is urged to declare cotton absolute contraband and to purchase Southern cotton exchanges to the amount of cotton that would normally have gone to Germany and Austria-Hungary, and also to the amount of cotton exports to Holland, Denmark, Norway, Sweden and Switzerland. The State Department at Washington, however, intimates that American rights in the matter will be insisted upon under the principles of international law.

SEA ISLAND COTTON.

The month of July has been extremely quiet; though the uncertainty occasioned by the rumors of contraband cotton has had a disquieting effect on the market. Shipments from Savannah from June 5 to July 3 were 176 Bs. to Northern mills and 273 Bs..

to Southern mills. From Jacksonville 75 Bs. were shipped to Northern mills during the same period. The crops are reported to be in fine condition. The increase in acreage in Carolina, Georgia and Florida is variously reported at 15 per cent. to 30 per cent., and crop estimates range around 100,000 Bs. to 110,000 Bs. The latest Savannah quotations are as follows: Choice, 24 cents; Extra Choice, 25 cents; Fancy, 26 cents.

EGYPTIAN COTTON.

From Alexandria, Egypt, we have the following report: The first week in July passed with little interest being taken in the market, which reflects the general trade dullness. The spot market is inactive, although a limited demand for Uppers was noticed. There was little change recorded by the middle of the month and speculation is conspicuous by its absence. Some July sales were bought back by the trade, owing to a limited demand from America. Spot prices are unchanged, although considerable business has been done. The exports of the week ending June 26, 1915, were 3,700 Bs. against 9,500 Bs. a year ago. Crop reports are very satisfactory.

COTTON FABRICS.

July has been a very quiet month and the domestic fabric market would be called stagnant if it were not for the war orders. Mills that would be running on half time or shut down altogether are busy on goods for export. Ducks especially have been in good demand for foreign account. Domestic business has been strictly routine during the past month and prices of fabrics in general have not changed.

The export embargo on burlaps from Calcutta is being strictly enforced by Great Britain. This has resulted in lower prices on the Calcutta market, and the uncertainty of shipments has caused a practical stagnation in the New York trade. Trading was quiet and limited to small orders for emergency requirements.

For the eleven months ending May 31, 1915, there was 353,538,495 pounds of burlap, valued at $25,031,432, imported into the United States, against 335,985,932 pounds, valued at $28,447,882, for the same period in 1914.

The following are New York quotations on July 30, 1915:

Tire Fabrics:		
17¼-ounce Sea Island, combed	*sq. yd.*	$ .58@$ .60
17¼-ounce Egyptian, combed		.45@ .47
17¼-ounce Egyptian, carded		.42@ .44
17¼-ounce Peelers, carded		.35@ .37
Sheetings:		
40-inch 2.50-yd.	*yd.*	.06¾
40-inch 2.70-yd.		.06½
40-inch 2.85-yd.		.06¼
40-inch 3.15-yd.		.06¼
Osnaburgs:		
40-inch 2.25-yd.	*yd.*	.07¼
40-inch 2.48-yd.		.07
37½-inch 2.42-yd.		.07
Mechanical Ducks:		
Hose duck	*lb.*	.20½
Belting Duck		.19½
Carriage Cloth Duck:		
38-inch 2.00-yd. enameling duck	*yd.*	.10½
38-inch 1.74-yd. enameling duck		.11½
72-inch 6.66 yd. enameling duck		.25
72-inch 7.21-yd. enameling duck		.26
Drills:		
38-inch 2.00-yd. drill	*yd.*	.10¼
40-inch 2.47-yd. drill		.08¼
52-inch 1.90-yd. drill		.10¾
52-inch 1.95-yd. drill		.10½
60-inch 1.52-yd. drill		.13½
Yarns:		
Garden Hose 12/2 cabled	*lb.*	.20
Fire Hose 12/1		.16@.18
Burlaps:		
32—7½-ounce burlap	100 *yd.*	$5.90
40—7½-ounce burlap		6.25
40—8-ounce burlap		6.35
40—10-ounce burlap		7.75
40—10½-ounce burlap		7.85
45—7½-ounce burlap		7.25
45—8-ounce burlap		7.35
48—10-ounce burlap		10.25

Exports of cotton duck from the port of New York, from May 28-July 18 inclusive, were as follows:

To Portugal, 41 packages, value $2,278; Denmark, 191 packages, value $6,166; France, 281 packages, value $22,760; England, 70,002 packages, value $208,506, and Glasgow, 7,760 packages, value $229,072.

United Kingdom.

IMPORTS OF RUBBER.

		June.			Six months ending June.		
From—		1913.	1914.	1915.	1913.	1914.	1915.
Dutch East Indies	*tons*	...	...	323	...	...	1,293
French West Africa		65	11	115	747	203	322
Gold Coast		56	30	17	568	198	141
Other Countries in Africa		...	...	345	...	...	1,378
Peru		131	58	130	697	466	584
Brazil		812	861	956	10,532	8,506	7,506
British India		...	...	30	...	...	766
Straits Settlements		1,093	1,272	2,214	7,094	9,416	17,127
Federated Malay States		625	576	938	4,665	5,091	6,341
Ceylon and Dependencies		352	430	652	2,725	3,567	7,932
Other Countries		1,630	1,203	318	9,459	8,134	1,093
Total		4,764	4,441	6,038	36,487	35,581	44,483

EXPORTS OF RUBBER.

		June.			Six months ending June.		
To—		1913.	1914.	1915.	1913.	1914.	1915.
Russia	*tons*	517	283	1,667	3,538	3,756	6,238
Germany		941	1,098	...	5,620	5,609	...
Belgium		158	168	...	991	1,179	...
France		420	663	404	2,408	3,578	3,217
United States		1,354	1,943	3,068	7,904	13,034	21,757
Other Countries		340	358	737	1,930	2,079	4,362
Total		3,730	4,513	5,876	22,391	29,235	35,574

RUBBER STATISTICS FOR LONDON AND LIVERPOOL—JUNE, 1915.

			Deliv-	Stocks.		
London—		Imports.	eries.	1913.	1914.	1915.
Plantation	*tons*	4,699	5,469	2,869	3,052	5,758
Other kinds		46	70	1,011	726	543
Total		4,745	5,539	3,880	3,778	6,301
Liverpool—						
Pará		974	833	1,336	819	1,323
Other kinds		586	448	1,326	1,096	624
Total		1,560	1,281	2,662	1,906	1,947
Total London and Liverpool		6,305	6,820	6,542	5,684	8,248

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"The money market has remained so steady for the past few months that there are practically no changes to report regarding rubber paper in July from the conditions prevailing as previously reported, the best names being taken at 4 @ 4½ per cent., and those not so well known 5 @ 5½ per cent."

NEW YORK PRICES FOR JUNE (NEW RUBBER).

	1915.	1914.	1913.
Upriver, fine	$0.61@0.63	$0.69@0.71	$0.87@0.92
Upriver, coarse	.45@ .47	.40@ .42	.54@ .62
Islands, fine	.52@ .55	.58@ .62	.82@ .85
Islands, coarse	.29@ .31	.27@ .29	.33@ .39
Cametá	.31@ .33	.31@ .34	.40@ .43

STOCKS—JULY 1, 1915.

		Fine and Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss	*pounds*	75,000	.....	20,000=	95,000
Henderson & Korn		10,000	10,000	10,000=	30,000
H. A. Astlett & Co.		10,000	8,000	.....=	18,000
Aldens' Successors, Ltd.		.....	.....	700=	700
Rubber Trading Co.		10,000	.....	.....=	10,000
Hagemeyer & Brunn		150,000	20,000	40,000=	210,000
A. D. Straus & Co.		80,000	.....	.....=	80,000
L. Hagenaers & Co.		80,000	.....	.....=	80,000
Muller, Schall & Co.		135,000	20,000	110,000=	265,000
Rubber & Guayule Agency, Inc.		15,000	.....	7,000=	22,000
Charles T. Wilson Co., Inc.		4,000	.....	.....=	4,000
Rumsey & Greutert Co., Inc.		60,000	.....	20,000=	80,000
Robert Badenhop		20,000	.....	.....=	20,000
W. R. Grace & Co.		67,000	21,000	55,000=	143,000
Neuss, Hesslein & Co.		91,000	8,000	.....=	99,000
Mecke & Co.		.....	.....	42,000=	42,000
Obalski & Sweeny		25,000	22,000	15,000=	62,000
Total		832,000	109,000	319,700=	1,260,700
Stock, Centrals	*pounds*				125,000
Stock, Africans					50,000
Arrivals, Plantations					14,143,600
Arrivals, Guayule					551,500

Review of the Crude Rubber Market.

NEW YORK.

July 30, 1915.

THE month of July started off with very little inquiry from manufacturers, and while a few sales were reported buying activity was decidedly lacking. The market, however, was firm and prices reflected the strong position of plantation rubber in the London market. Prices remained about the same for all grades as the month progressed and the market continued quiet and steady. By the middle of the month a fair volume of business was reported in some quarters. Arrivals of plantation rubber were quite heavy during this period but the greater part was on contract, and prices remained firm. Little interest was shown in Para sorts. Other grades continued firm in price with fair trading according to the stocks that were arriving. During the last week of the month the cargoes due to arrive from London and the Far East had a depressing effect on the market, which was quiet but with prices firm. First latex spot was quoted at 63 cents, and Upriver fine spot was quoted at 61@62 cents.

RUBBER AFLOAT.

The steamship "Merity," of the Companhia Commercio e Navegacao, with 50 tons of rubber from Para, is now due in New York. The steamship "Achilles," of the Ocean Steamship Co., Limited (Blue Funnel line), Booth & Co., of New York, agents, is afloat from Java with plantation rubber and is due to arrive early in August. There was 4,153 tons of plantation rubber received at the port of New York from London during June, and 1,596 tons from Singapore and Colombo. The shipments from Batavia, Java, were very small during that month and only amounted to 500 tons.

Crude rubber imports for the eleven months ending May 31, 1915, were 153,282,616 pounds, valued at $73,324,551, against 122,567,042 pounds valued at $66,321,789, for the same period in 1914.

LONDON.

Early in the month of July a firm market with good inquiry for both spot and future deliveries was noted, and prices were slightly in advance of those of the week before. On July 10, Standard crêpe was selling at 2*s.* 7½*d.* for spot, Smoked sheet was 2*s.* 7*d.* and hard Para 2*s.* 7¼*d.* There was a good deal of interest shown in spot crêpe, and considerable business was noted in this particular grade. Prices for future delivery have improved somewhat, although buying has been restricted. August delivery has been quoted at 2*s.* 5¾*d.* to 2*s.* 7¼*d.* September deliveries are quoted at from 2*s.* 5⅝*d.* to 2*s.* 6¾*d.* Smoked sheets have not been in much demand and are held at about a half penny per pound less than spot crêpe.

In the weekly report of Messrs. Sanderson & Co., the stocks in London on the 2nd of January are given as 6,877 tons, and on the 3rd of July as 6,366 tons, showing a decline of 511 tons in six months. The largest stock held during the last six months was on the 17th of April, namely, 7,922 tons; so that in the last six weeks stocks have been reduced 1,556 tons. The arrivals in London for 1915 to the 3rd of July total 35,616 tons, deliveries during the same period being 36,062 tons. From February to May, inclusive, the United States imported 34,000 tons. Crop estimates for 1915 are: 85,000 tons plantation; 38,000 tons Para sorts; 10,000 tons from all other sources; total, 133,000 tons.

The price of plantation at the beginning of the war was 2*s.* 0½*d.* for crêpe and 2*s.* 1*d.* for Smoked sheet. On January 1, it was 2*s.* 1*d.* for crêpe and 2*s.* 3*d.* for Smoked sheet, and on July 15 it was 2*s.* 7¼*d.* for crêpe and 2*s.* 6¾*d.* for Smoked sheet. The price of Para at the beginning of the war was 2*s.* 10½*d.* On the first of January it was 2*s.* 10*d.*, and on July 15 was 2*s.* 7½*d.*

SINGAPORE AND COLOMBO.

At the auction held in Singapore May 19, 182 tons was offered and 100 tons changed hands. On May 26, 210 tons was offered and 120 tons was sold. There was a large quantity offered at the auction held June 2, 220 tons being catalogued, but only 105 tons was sold. On June 9, 196 tons was offered and 130 tons was sold, at prices which generally marked a decided improvement. There was 255 tons catalogued on June 16 and 166 tons changed hands. The demand throughout the sale was good and all grades met with a ready sale at better prices.

At the Colombo weekly auction held May 28, 192 tons of rubber was offered and 166 tons was sold. On June 2, 135 tons was offered and 84 tons was sold. On June 24, there was 177 tons offered. The Ceylon Planters' Rubber Syndicate recently sold 12 tons of No 1 diamond smoked sheet, to be delivered in Colombo as follows: Two tons per month from July 1 to December 31, 1915, at 1*s.* 5½*d.* per pound.

The total export of Ceylon rubber from January 1, 1915, to June 21, was 8,357 tons, as compared to 6,848 tons in 1914 for the same period.

Cable advices state that the export of rubber from the Federated Malay States for the month of June last, amounted to 3,403 tons, as compared with 2,708 tons in May, making a total for the six months of 19,190 tons, as against 13,850 tons in the corresponding period of 1914.

The export of rubber from the various ports of the Straits Settlements for the month of June totaled 2,249 tons, as compared with 3,588 tons in May; bringing the total for the first six months of the year up to 15,609 tons, as against 8,506 tons in the simliar period in 1914. These figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Java, Sumatra, Borneo and the non-federated Malay States, as well as rubber actually exported from the colony. There was 55,700 pounds sold at the Penang auction held on June 8.

NEW YORK QUOTATIONS.

The following are the quotations at New York one year ago, one month ago, and July 30, the current date:

PARA.	Aug. 1, '14.	July 1, '15.	July 30, '15.
Upriver, fine, new..	72 @73½	62½@63	60 @60½
Upriver, fine, old...	72 @75	63 @65	61 @63
Islands, fine, new...	57 @59	53½@54	51½@52
Islands, fine, old....	58 @62	55 @57	55 @56
Upriver, coarse, new	39½@42	45½@46	44 @
Islands, coarse, new	27 @29	28½@29	28 @
Cameta	30½@31½	31½@32	31 @
Caucho, upper	38 @41	46 @46½	45½@
Caucho, lower	35 @37	43 @44	43 @
PLANTATION HEVEA.			
Smoked sheet ribbed	56 @59	Spot 63 @ / Afloat 62½@63	62 @ / 61½@
First latex crepe....			
near-by	53 @56	Spot 63 @	63 @
forward	52 @53	Afloat 62½@63	62½@
Fine sheets and biscuits unsmoked...	54 @56	60 @61	60 @
CENTRALS.			
Corinto	39 @42	44 @45	43½@
Esmeralda, sausage.	38 @41	44 @45	42½@
Nicaragua, scrap....	35 @40	.....	42 @
Mexican, scrap.....	36 @41	44 @	42½@
Mexican, slab.....	25 @35	.....	.....
Manicoba, scrap ...	.....	37 @38	37 @38
Mangabeira, sheet...	.....	38 @39	38 @
Guayule	25 @35	32 @34	34 @35
Balata, sheet	45 @58	53 @56	55 @56
Balata, block	48 @53	45 @47	47 @48

AFRICAN.			
Lopori, ball, prime..	45 @53	54 @56	53 @54
Aruwimi	38 @47	.....	.....
Ikelemba	38 @45	.....	.....
Sierra Leone, 1st quality	35 @47	.....	.....
Massai, red	40 @50	53 @54	52 @53
Soudan Niggers	36 @46	.....	.....
Cameroon, ball	25 @35	.....	.....
Benguela	25 @31½	32¾@33	33 @
Madagascar, pinky	.....	.....	.....
Accra, flake	22 @22½	23 @	22½@
Rio Nunez Niggers	.....	55 @56	55 @
Konakry Niggers	.....	54 @	53 @
Gold Coast, lump	.....	27 @	27 @
EAST INDIAN.			
Assam	35 @55	48½@49	44 @48
Pontianak	5⅞@ 6½	7 @ 7½	7¼@ 7½
Gutta Siak	.....	14 @14½	12½@14
Borneo III	20 @25	.....	.....
Borneo II	27 @29	.....	.....
Gutta Percha	.....	.....	50 @1.50

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to June 21, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To—	1914.	1915.
Great Britain ..... *pounds*	7,235,552	11,727,896
United States	4,311,149	5,644,438
Belgium	2,315,192	.....
Germany	849,187	.....
Canada and Newfoundland	.....	340,140
Japan	177,606	183,739
France	144,043	209,576
Australia	162,885	168,081
Russia	98,482	327,720
Straits Settlements	37,249	119,933
India	500	500
Italy	312	.....
Total	15,332,157	18,722,023

(Same period 1913, 9,875,462 pounds; same period 1912, 5,044,285.)

The export figures of rubber given in the above table for 1914 include the imports re-exported. (These amount to 1,813,360 pounds). To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

TOTAL EXPORTS FROM MALAYA.

(From January to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore. May 31.	Malacca. May 30.	Penang. May 31.	Port Swettenham. June 16.	Total.
Great Britain..*pounds*	15,010,014	3,864,357	7,817,865	12,319,430	29,011,666
Continent	2,915,527	.....	162,399	20,160	3,098,086
Japan	734,708	.....	.....	.....	734,708
Ceylon	109,199	.....	140,533	678,507	928,239
United States	9,816,793	.....	110,000	.....	9,926,793
Australia	214,060	.....	.....	.....	214,060
Total	28,800,301	3,864,357	8,230,797	13,018,097	53,913,552
Same period, 1914	15,195,659	1,772,527	5,398,000	12,944,465	35,310,651
Same period, 1913	9,564,859	.....	4,589,733	12,290,146	26,444,738
Same period, 1912	5,014,131	.....	2,434,719	9,135,496	16,584,346

Singapore.

Guthrie & Co., Ltd., report [June 16, 1915]:

The quantity of rubber offered at today's auction easily established a fresh record, 255 tons being catalogued, 166 tons of which changed hands. Demand throughout was good and all grades met with a ready sale at much improved prices.

Fine pale crepe and fine smoked sheet occupied pride of place at $129, marking increases of $2 and $1 respectively. Plain smoked sheet was in good demand, one lot fetching $127, an improvement of $2.

The lower grades moved off freely at an average advance of $3.

Among scraps the prices of $104 and $97 paid for virgin and pressed were $9 higher than last week's best. Loose was $3 better at $95.

The following was the course of values:

	In Singapore, Picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked	$127@129	2/ 5⅝@2/ 6½	60.05@61.83
Sheet, fair to good ribbed smoked	116@125	2/ 3⅜@2/ 5¼	55.49@59.29
Sheet, plain smoked	117@127	2/ 3½@2/ 5⅝	55.75@60.05
Sheet, unsmoked	115@120	2/ 3½@2/ 4¼	54.98@57.27
Crepe, fine pale	127@129	2/ 5⅜@2/ 6⅛	60.05@61.06
Crepe, good pale	124@126	2/ 5 @2/ 5½	58.79@59.80
Crepe, fine brown	119@124	2/ 4 @2/ 5	55.76@58.79
Crepe, good brown	110@118	2/ 2⅛@2/ 3¾	52.95@56.25
Crepe, dark	106@111	2/ 1¾@2/ 2¼	51.18@53.21
Crepe, bark	102@109	2/ 0⅛@2/ 1⅞	48.90@52.45
Scrap, virgin	86@104	1/ 9 @2/ 0⅜	42.57@50.42
Scrap, loose	84@ 95	1/ 8⅝@1/11	41.81@46.62
Scrap, pressed	92@ 97	1/10⅜@1/11¾	45.35@47.38

*Picul. = 133⅓ pounds.

Quoted in S. S. dollars = 2/4 [56 cents].

IMPORTS FROM PARA AT NEW YORK.

[*The Figures Indicate Weights in Pounds.*]

JUNE 25.—By the steamer *Sao Paulo* from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown	41,600	2,700	70,300	54,700=	169,300
G. Amsinck & Co.	23,300	400	8,900	72,800=	105,400
H. A. Astlett & Co.	12,200	3,100	15,700	23,900=	54,900
Hagemeyer & Brunn	42,400	.....	7,100	4,600=	54,100
Henderson & Korn	6,800	2,300	34,100	4,400=	47,600
Arnold & Zeiss	.....	3,400	13,400	27,400=	44,200
A. D. Straus & Co.	21,100	.....	.....	.....=	21,100
Muller, Schall & Co.	11,700	.....	5,400	.....=	17,100
General Rubber Co.	11,600	1,000	400	.....=	13,000
Neuss, Hesslein & Co.	5,700	.....	.....	.....=	5,700
Total	176,400	12,900	155,300	187,800=	532,400

JUNE 29.—By the steamer *Denis* from Pará and Manáos:

Meyer & Brown	28,200	3,600	93,500	49,200=	174,500
Arnold & Zeiss	59,700	15,700	44,000	23,000=	142,400
Hagemeyer & Brunn	53,900	.....	33,000	1,200=	88,100
G. Amsinck & Co.	17,900	.....	12,300	41,100=	71,300
Henderson & Korn	4,600	400	19,100	10,200=	34,300
J. T. Johnstone & Co.	.....	.....	10,700	9,800=	20,500
Robinson & Co.	1,000	500	11,600	300=	13,400
H. A. Astlett & Co.	700	100	6,600	3,600=	11,000
Rumsey & Greutert Co., Inc.	400	.....	300	3,000=	3,700
Total	166,400	20,300	231,100	141,400=	559,200

JULY 12.—By the steamer *Acre* from Pará and Manáos:

Meyer & Brown	122,400	18,100	114,600	26,500=	281,600
Arnold & Zeiss	13,900	700	41,700	59,800=	116,100
Henderson & Korn	4,000	7,500	12,700	86,700=	110,900
Robinson & Co.	40,100	.....	8,500	2,900=	51,500
Muller, Schall & Co.	7,900	.....	6,000	28,900=	42,800
H. A. Astlett & Co.	5,300	4,800	12,800	10,200=	33,100
G. Amsinck & Co.	8,000	800	5,600	.....=	14,400
Total	201,600	31,900	201,900	215,000=	650,400

JULY 16.—By the steamer *Boniface* from Pará and Manaos:

Meyer & Brown	63,500	17,000	98,200	81,800=	260,500
Arnold & Zeiss	166,000	16,800	71,000	128,400=	382,200
Henderson & Korn	4,900	28,200	34,000	32,500=	99,600
H. A. Astlett & Co.	3,100	1,800	69,900	22,900=	97,700
Robinson & Co.	16,600	3,200	9,800	20,200=	49,800
G. Amsinck & Co.	16,100	1,400	6,100	9,900=	33,500
W. R. Grace & Co.	32,800	.....	.....	.....=	32,800
Aldens' Successors, Ltd.	6,000	500	1,100	24,000=	31,600
Hagemeyer & Brunn	.....	.....	11,100	12,800=	23,900
J. T. Johnstone & Co.	.....	.....	11,200	.....=	11,200
Total	309,000	68,900	312,400	332,500=	1,022,800

PARA RUBBER VIA EUROPE.

	Pounds.	
JUNE 29.—By the *Tenadores*=Cristobal:		
Neuss, Hesslein & Co (Fine)	4,500	
Rubber & Guayule Agency, Inc. (Fine)	4,000	
Rubber & Guayule Agency, Inc. (Coarse)	6,500	15,000
JULY 22.—By the *Nickerie*=La Guayra:		
G. Amsinck & Co. (Fine)	56,600	
G. Amsinck & Co. (Coarse)	25,000	
General Export & Commission Co. (Fine)	25,000	
General Export & Commission Co. (Coarse)	10,000	116,000

CENTRALS.

JUNE 25.—By the *Colon*=Colon:		
G. Amsinck & Co.	6,000	
Commercial Bank of Spanish America	900	
J. J. Julia & Co.	700	
Harburger & Stack	500	8,100
JUNE 25.—By the *Sao Paulo*=Bahia:		
Adolph Hirsch & Co.	28,000	
Lawrence Johnson & Co.	17,000	45,000
JUNE 26.—By the *Sixaola*=Puerto Cortez:		
A. Rosenthal & Sons	3,000	
G. Amsinck & Co.	1,500	
Eggers & Heinlein	1,200	5,700
JUNE 26.—By the *Carrillo*=Cartagena:		
International Banking Corp.	7,000	
Mecke & Co.	3,500	10,500
JUNE 29.—By the *Denis*=Parnahyba:		
J. H. Rossbach Bros.		28,000
JUNE 29.—By the *Tenadores*=Port Limon:		
Isaac Brandon & Bros.	1,500	
A. Held	1,000	
G. Amsinck & Co.	4,500	7,000
JUNE 30.—By the *Ancon*=Colon:		
G. Amsinck & Co.	6,500	
Commercial Bank of Spanish America	1,600	
Dumarest Bros.	700	
Dreisco, Duke & Co.	1,000	9,800
JULY 1.—By the *Antilles*=New Orleans:		
A. N. Rotholz		10,000
JULY 1.—By the *Santa Marta*=Cartagena:		
Mecke & Co.	2,500	
G. Amsinck & Co.	2,500	5,000
JULY 6.—By the *Advance*=Colon:		
G. Amsinck & Co.	7,500	
Lawrence Johnson & Co.	2,600	
Santiago Smithers	2,000	
J. S. Sembrada & Co.	2,200	
Hermann Wolff & Co.	2,000	
Pablo, Calvet & Co.	1,500	
A. M. Capens' Sons	3,200	
Goutard & Co.	1,000	
Camacho, Roldan & Van Sickel	800	
M. A. De Leon	700	
Piza, Nephews & Co.	4,500	
Mecke & Co.	3,500	
Various	4,600	36,100
JULY 6.—By the *Morro Castle*=Mexico:		
Gen. Export & Commission Co.	1,200	
Graham, Hinkley & Co.	1,200	
Diez & Co.	1,200	3,600
JULY 6.—By the *Proteus*=New Orleans:		
Various		10,000
JULY 6.—By the *Metapan*=Port Limon:		
Isaac Brandon & Bros.	2,000	
W. R. Grace & Co.	1,500	
Suzarte & Whitney	500	4,000
JULY 8.—By the *Almirante*=Cartagena:		
International Banking Corp.		8,000

JULY 9.—By the *Panama*=Colon:

W. R. Grace & Co.	3,500	
G. Amsinck & Co.	500	4,000

JULY 12.—By the *Tivives*=Port Barnes:

A. Rosenthal & Sons	2,000	
M. C. Keith	2,000	4,000

JULY 12.—By the *Camoens*=Bahia:

Adolph Hirsch & Co.		13,500

JULY 13.—By the *Pastores*=Port Limon:

Isaac Brandon & Bros.	2,500	
A. A. Linde & Co.	1,000	3,500

JULY 14.—By the *Cristobal*=Colon:

W. R. Grace & Co.	55,000	
G. Amsinck & Co.	3,000	58,000

JULY 16.—By the *Boniface*=Parnahiba:

J. H. Rossbach Bros.		65,000

JULY 17.—By the *Proteus*=New Orleans:

E. Steiger & Co.		18,000

JULY 17.—By the *Alliance*=Colon:

G. Amsinck & Co.	8,600	
Pablo, Calvet & Co.	2,400	
J. S. Sembrada & Co.	2,100	
A. M. Capens' Sons	1,900	
American Trading Co.	1,600	
Harburger & Stack	1,400	
Hermann Wolff & Co.	900	
Goutard & Co.	200	19,100

JULY 17.—By the *Zacapa*=Cartagena:

International Banking Corp.	7,000	
De Lima, Cortissoz & Co.	500	7,500

JULY 19.—By the *Mexico*=Mexico:

Lawrence Johnson & Co.	15,000	
G. Amsinck & Co.	500	
Gen. Export & Commission Co.	1,000	
Various	500	17,000

JULY 19.—By the *El Oriente*=Galveston:

Various (Guayule)		*67,000

JULY 19.—By the *Eastern Prince*=Bahia:

Adolph Hirsch & Co.		75,000

JULY 19.—By the *Antilles*=New Orleans:

Harburger & Stack		3,000

JULY 19.—By the *Calamares*=Port Limon:

G. Amsinck & Co.	3,000	
Suzarte & Whitney	1,500	
Isaac Brandon & Bros.	600	
A. A. Linde & Co.	600	5,700

JULY 23.—By the *Colon*=Colon:

G. Amsinck & Co.	6,900	
Andean Trading Co.	1,900	
Lawrence, Johnson & Co.	1,600	
Pottberg, Ebeling & Co.	1,000	
W. R. Grace & Co.	700	
Isaac Brandon & Bros.	300	
M. A. de Leon & Co.	200	12,600

JULY 23.—By the *Carrillo*=Cartagena:

International Banking Corporation		3,000

AFRICANS.

JUNE 26.—By the *Quebra*=Liverpool:

Aldens' Successors, Ltd.	34,000	
Rubber Trading Co.	22,500	56,500

JUNE 29.—By the *Saxonia*=Liverpool:

Goodyear Tire & Rubber Co.	67,000	
Arnold & Zeiss	60,000	
Rubber Trading Co.	22,500	
General Rubber Co.	40,000	189,500

JULY 6.—By the *St. Louis*=Liverpool:

Rubber & Guayule Agency, Inc.		11,200

JULY 6.—By the *Lapland*=Liverpool:

Aldens' Successors, Ltd.		70,000

JULY 7.—By the *Espagne*=Havre:

Various		35,000

JULY 12.—By the *Baltic*=Liverpool:

Henderson & Korn		2,500

JULY 13.—By the *Kentigern*=London:

Henderson & Korn		10,000

JULY 16.—By the *St. Andrew*=Lisbon:

S. R. Sequerra	135,000	
Charles T. Wilson Co., Inc.	9,000	
William H. Stiles	45,000	
Edward Maurer Co., Inc.	160,000	
Robert Badenhop	22,500	
W. G. Ryckman	2,000	
Various	45,000	418,500

JULY 19.—By the *Orduna*=Liverpool:

Arnold & Zeiss	130,000	
Goodyear Tire & Rubber Co.	56,000	
Rubber Trading Co.	29,000	
Henderson & Korn	7,000	222,000

JULY 24.—By the *Arabic*=Liverpool:

Henderson & Korn	7,000	
Various	11,200	18,200

JULY 26.—By the *Den of Airlie*=Liverpool:

Goodyear Tire & Rubber Co.	60,000	
Rubber Trading Co.	3,500	63,500

EAST INDIAN.

[*Denotes plantation rubber.]

JUNE 25.—By the *City of Lincoln*=Colombo:

Meyer & Brown	*95,000	
L. Littlejohn & Co.	*130,000	
J. T. Johnstone & Co.	*90,000	
Goodyear Tire & Rubber Co.	*7,000	
Edward Maurer Co., Inc.	*15,000	
Henderson & Korn	*15,000	*352,000

JUNE 26.—By the *Quebra*=Liverpool:

The B. F. Goodrich Co.	*15,000	

JUNE 28.—By the *Lord Cromer*=Colombo:

Meyer & Brown	*80,000	
L. Littlejohn & Co.	*95,000	
J. T. Johnstone & Co.	*35,000	
Aldens' Successors, Ltd.	*56,000	
Various	*9,000	*275,000

JUNE 28.—By the *Mesaba*=London:

The B. F. Goodrich Co.	*135,000	
W. R. Grace & Co.	*28,000	
Edward Maurer Co., Inc.	*240,000	
Charles T. Wilson Co., Inc.	*100,000	
Hood Rubber Co.	*33,500	
Robert Badenhop	*4,500	
Henderson & Korn	*28,000	
L. Littlejohn & Co.	*11,200	*580,200

JUNE 28.—By the *Kazembe*=Singapore:

The B. F. Goodrich Co.	*425,000	
J. T. Johnstone & Co.	*125,000	
L. Littlejohn & Co.	*216,000	
Henderson & Korn	*11,200	
F. Stern & Co.	*11,200	
Arnold & Zeiss	*125,000	
Aldens' Successors, Ltd.	*129,000	
Edward Maurer Co., Inc.	*4,500	
Core & Herbert	*2,200	
Goodyear Tire & Rubber Co.	*110,000	*1,159,000

JUNE 29.—By the *Minnehaha*=London:

Meyer & Brown	*112,000	
Goodyear Tire & Rubber Co.	*180,000	
Edward Maurer Co., Inc.	*160,000	
J. T. Johnstone & Co.	*45,000	
Charles T. Wilson Co., Inc.	*90,000	
Robert Badenhop	*60,000	*647,000

JUNE 29.—By the *Saxonia*=Liverpool:

Arnold & Zeiss		*15,000

JULY 1.—By the *Tronto*=London:

Meyer & Brown	*45,000	
Edward Maurer Co., Inc.	*50,000	
The B. F. Goodrich Co.	*120,000	
L. Littlejohn & Co.	*100,000	
Hadden & Co., Inc.	*4,500	
Rumsey & Greutert Co., Inc.	*70,000	
Aldens' Successors, Ltd.	*545,000	
Robinson & Co.	*70,000	
General Rubber Co.	*260,000	
Arnold & Zeiss	*90,000	
J. T. Johnstone & Co.	*55,000	

JULY 7.—By the *Hercules*=Singapore:

Henderson & Korn	*210,000	
L. Littlejohn & Co.	*160,000	
Arnold & Zeiss	*20,000	
Goodyear Tire & Rubber Co.	*65,000	
J. T. Johnstone & Co.	*200,000	
Charles T. Wilson Co., Inc.	*67,000	
Robert Badenhop	*50,000	
Hood Rubber Co.	*22,500	
The B. F. Goodrich Co.	*380,000	
General Rubber Co.	*160,000	
Aldens' Successors, Ltd.	*1,800	
Various	*39,700	*1,376,000

JULY 9.—By the *Tropea*=London:

Meyer & Brown	*111,000	
Edward Maurer Co., Inc.	*115,000	
General Rubber Co.	*150,000	
The B. F. Goodrich Co.	*15,000	
J. T. Johnstone & Co.	*7,000	
W. R. Grace & Co.	*1,000	
Robinson & Co.	*56,000	
L. Littlejohn & Co.	*130,000	
Aldens' Successors, Ltd.	*522,000	
Rumsey & Greutert Co., Inc.	*22,500	
Goodyear Tire & Rubber Co.	*15,000	
Rubber Trading Co.	*65,000	*1,209,500

JULY 12.—By the *Philadelphian*=London:

Meyer & Brown	*46,000	
L. Littlejohn & Co.	*35,000	
Goodyear Tire & Rubber Co.	*100,000	
General Rubber Co.	*22,500	
Edward Maurer Co., Inc.	*85,000	
Robert Badenhop	*40,000	
Hood Rubber Co.	*20,000	
Charles T. Wilson Co., Inc.	*135,000	
Various	*45,000	*528,500

JULY 12.—By the *Indradeo*=Singapore:

Arnold & Zeiss	*100,000	
General Rubber Co.	*90,000	
L. Littlejohn & Co.	*200,000	
Goodyear Tire & Rubber Co.	*112,000	
The B. F. Goodrich Co.	*690,000	
Henderson & Korn	*330,000	
Charles T. Wilson Co., Inc.	*145,000	
J. T. Johnstone & Co.	*60,000	
Robert Badenhop	*33,500	
Aldens' Successors, Ltd.	*13,000	
Various	*22,000	*1,795,500

JULY 13.—By the *Kentigern*=London:

Meyer & Brown	*145,000	
Edward Maurer Co., Inc.	*25,000	
J. T. Johnstone & Co.	*100,000	
Aldens' Successors, Ltd.	*309,000	
Rubber Trading Co.	*67,000	
W. R. Grace & Co.	*60,000	
The B. F. Goodrich Co.	*55,000	
Henderson & Korn	*40,000	
Arnold & Zeiss	*230,000	
Michelin Tire Co.	*7,000	
L. Littlejohn & Co.	*11,200	
Rumsey & Greutert Co., Inc.	*30,000	
Hadden & Co., Inc.	*7,000	
Various	*11,000	*1,097,200

JULY 19.—By the *Orduna*=Liverpool:

Arnold & Zeiss		*4,500

JULY 19.—By the *New York*=Liverpool:

L. Littlejohn & Co.		*9,000

JULY 19.—By the *Manhattan*=London:

Meyer & Brown	*113,100	
General Rubber Co.	*100,000	
Edward Maurer Co., Inc.	*85,000	
Charles T. Wilson Co., Inc.	*100,000	
Robert Badenhop	*70,000	
Various	*22,500	*490,600

JULY 23.—By the *Samland*=London:

Goodyear Tire & Rubber Co.	*200,000	
Edward Maurer Co., Inc.	*22,500	
Robert Badenhop	*100,000	
Charles T. Wilson Co., Inc.	*190,000	
Arnold & Zeiss	*215,000	*727,500

JULY 24.—By the *Arabic*=Liverpool:

J. T. Johnstone & Co.		*7,000

JULY 24.—By the *Riverdale*=Colombo:

Meyer & Brown	*89,000	
General Rubber Co.	*160,000	
L. Littlejohn & Co.	*125,000	
J. T. Johnstone & Co.	*25,000	
Edward Maurer Co., Inc.	*75,000	
Henderson & Korn	*33,500	
W. R. Grace & Co.	*12,500	
Goodyear Tire & Rubber Co.	*11,200	
Various	*104,000	*635,200

CUSTOM HOUSE STATISTICS

PORT OF PORT HURON—MAY, 1915.

	Pounds.	Value.
Exports:		
Rubber scrap	2,690	$166

PORT OF PORT HURON—JUNE, 1915.

Imports:		
India rubber scrap	29,110	$1,310

PORT OF NEW YORK—MARCH, 1915.

Imports:		
India rubber	23,400,994	$11,281,684
Balata	160,942	58,333
Gutta percha	48,022	12,581
Gutta jelutong (pontianak)	202,505	9,948
Rubber scrap	289,299	14,123
Total	24,101,762	$11,376,669
Exports:		
India rubber	363,783	$206,943
Balata	79,309	28,301
Rubber scrap	93,291	17,978

PORT OF NEW YORK—APRIL, 1915.

Imports:		
India rubber	20,048,564	$10,062,191
Balata	101,232	39,056
Gutta percha	385,693	50,402
Gutta jelutong (pontianak)	1,605,580	85,800
Rubber scrap	491,403	38,284
Total	22,632,472	$10,275,733
Exports:		
India rubber	209,620	$106,595
Balata	57,636	19,931
Rubber scrap	239,742	34,038

PORT OF NEW YORK—MAY, 1915.

Imports:		
India rubber	15,940,021	$8,019,734
Balata	124,327	46,953
Gutta percha	149,845	17,413
Gutta jelutong (pontianak)	155,580	9,028
Rubber scrap	419,856	29,850
Total	16,789,629	$8,122,978
Exports:		
India rubber	10,205	$4,907
Balata	117,295	55,347
Gutta percha	5,997	3,115
Rubber scrap	258,904	35,836

PORT OF BOSTON—JUNE, 1915.

Imports:		
India rubber	10,119	$4,981
Gutta percha	4,543	1,013
Gutta jelutong (pontianak)	111,876	6,775
Rubber scrap	70,944	4,281
Total	197,482	$17,050
Exports:		
India rubber, scrap and old	20,594	$2,389

PORT OF NIAGARA FALLS—JUNE, 1915.

Imports:		
India rubber	259,250	$113,530
Rubber scrap, imported	30,000	2,130
Total	289,250	$115,660

PORT OF CLEVELAND—JUNE, 1915.

Imports:		
India rubber	1,050	$630
Scrap rubber	100,963	4,757
Total	102,013	$5,387

PORT OF PHILADELPHIA—JUNE, 1915.

Imports:		
Rubber scrap	65,888	$4,942
Exports:		
Rubber scrap	6,010	$450

PORT OF DETROIT—JUNE, 1915.

Imports:		
Rubber scrap	25,675	$2,353

Exports:

Rubber scrap	29,100	$1,310
Rubber reclaimed	2,000	325

PORT OF NEW ORLEANS—JUNE, 1915.

Imports:		
Crude rubber	35,771	$11,848

PORT OF SAN FRANCISCO—JUNE, 1915.

Imports:		
India rubber	149	$47
Gutta jelutong	26,733	1,415
Total	26,882	$1,462

RUBBER RECEIPTS AT MANAOS FROM JULY, 1914, TO JUNE, 1915.

	From Javary, Iquitos, Solimões.		From Juruá.		From Acre and Purús.		From Madeira.		From Negro.	Total.		Grand Total.
1914.	Borracha.	Caucho.	Borracha.	Caucho.	Borracha.	Caucho.	Borracha.	Caucho.	Borracha.	Borracha.	Caucho.	
July ..... *tons*	46	92	34	6	552	35	261	126	2	895	259	1,154
August	139	34	90	6	407	78	369	88	1	1,006	206	1,212
September	209	3	176	4	775	62	322	43	8	1,490	112	1,602
October	503	149	185	9	986	28	321	64	5	2,000	250	2,250
November	208	2	182	2	677	45	500	87	28	1,595	136	1,731
December	448	13	368	11	936	67	570	97	77	2,399	188	2,587
Total	1,553	293	1,035	38	4,333	315	2,343	505	121	9,385	1,151	10,536
1915.												
January	231	16	889	105	1,186	222	491	69	122	2,919	412	3,331
February	691	354	307	11	2,110	300	637	222	85	3,830	887	4,717
March	157	28	416	19	764	232	638	291	65	2,040	570	2,610
April	205	127	316	82	215	133	214	240	62½	1,012	584	1,596
May	93	154	220	48	375	108	442	310	30	1,160	620	1,780
June	47	12	112	26	512	186	262	176	7	940	400	1,340
Total	1,424	691	2,260	291	5,162	1,181	2,684	1,308	371½	11,901	3,473	15,374
Grand total.....	2,977	984	3,295	329	9,495	1,496	5,027	1,813	492½	21,286	4,624	25,910

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JUNE, 1915.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Total.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Total.	Grand Total.
Suter & Co. ..... *kilos*	44,074	6,726	22,909	77,881	151,590	34,437	1,159	146	12,600	48,342	199,932
General Rubber Co. of Brazil.....	23,069	8,747	29,207	49,888	110,911	60,837	24,469	1,180	44,197	130,683	241,594
Adelbert H. Alden, Ltd.....	1,755	1,091	507	11,158	14,511	31,469	10,742	14,862	64,025	121,098	135,609
Pralow & Co.....	28,658	1,733	17,617	8,167	56,175	50,457	4,740	523	13,259	68,979	125,154
Tancredo Porto & Co.....	344	40	3,514	7,792	11,690	28,584	17,800	6,701	14,038	67,123	78,813
G. Fradelizi	.....	.....	10,707	4,670	15,377	8,609	6,080	129	.....	14,818	30,195
Stowell & Sons	.....	.....	.....	.....	.....	10,255	1,893	1,042	6,433	19,623	19,623
Zarges, Ohliger & Co.....	12,421	.....	283	.....	12,704	.....	.....	.....	.....	.....	12,704
Theodore Levy, Camille Co.....	.....	.....	.....	.....	.....	412	37	5,491	3,829	9,769	9,769
B. Levy & Co.....	.....	.....	.....	.....	.....	4,781	.....	2,805	339	7,925	7,925
G. Deffner & Co.....	4,757	.....	1,800	44	6,601	.....	.....	.....	.....	.....	6,601
Semper & Co.....	5,068	.....	.....	.....	5,068	.....	.....	.....	.....	.....	5,068
J. G. Araujo.....	.....	.....	.....	.....	.....	244	290	1,475	160	2,169	2,169
Mesquita & Co.....	6	.....	.....	.....	6	320	.....	930	.....	1,250	1,256
Soc. An. Armazens Andresen.....	195	.....	150	.....	345	.....	.....	.....	.....	.....	345
Total	120,347	18,337	86,694	159,600	384,978	230,405	67,210	35,284	158,880	491,779	876,757
To Buenos Aires:											
Tancredo, Porto & Co. (fine)....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,120
To Rio de Janeiro:											
Matheus, Silva & Co. (coarse).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	600
Total	120,347	18,337	86,694	159,600	384,978	230,405	67,210	35,284	158,880	491,779	878,477

EXPORTS OF INDIA RUBBER FROM MANAOS FROM JANUARY TO JUNE, 1915.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Total.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Total.	Grand Total.
General Rubber Co. of Brazil. *kilos*	436,914	102,205	250,556	190,945	980,620	546,698	142,662	34,075	223,047	946,482	1,927,102
Pralow & Co.....	482,336	28,494	283,806	144,998	939,634	332,600	60,425	48,944	70,048	512,017	1,451,651
Suter & Co.....	310,431	31,503	187,544	284,673	814,151	360,040	27,995	9,844	174,883	572,762	1,386,913
G. Fradelizi & Co.....	148,756	13,600	125,253	139,415	427,024	371,042	95,482	32,103	57,130	555,757	982,781
Adelbert H. Alden, Ltd...	11,742	12,691	17,912	11,823	54,168	316,372	62,665	100,794	201,938	681,769	735,937
Tancredo Porto & Co.....	43,089	20,351	29,615	9,118	102,173	186,918	48,240	44,754	72,737	352,649	454,822
J. G. Araujo.....	21,852	3,252	7,094	911	33,109	184,599	17,380	8,465	950	211,394	244,503
B. Levy & Co.....	33,829	4,281	3,681	2,204	43,995	42,879	79	3,727	9,815	56,500	100,495
Sundry shippers	101,883	8,321	21,249	47,248	178,701	114,151	14,126	26,996	42,729	198,002	376,703
Total	1,590,832	224,698	926,710	831,335	3,573,575	2,455,299	469,054	309,702	853,277	4,087,332	7,660,907
Iquitos, transit	143,227	15,776	80,371	512,613	751,987	224,021	15,113	54,100	250,655	543,889	1,295,876
Grand total	1,734,059	240,474	1,007,081	1,343,948	4,325,562	2,679,320	484,167	363,802	1,103,932	4,631,221	8,956,783

EXPORTS OF INDIA RUBBER AND CAOUTCHOUC FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF MAY, 1915.

EXPORTERS—	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Total.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Total.	GRAND TOTAL.
Zarges, Berringer & Co. ..... *kilos*	13,262	.....	489	10,446	24,197	.....	.....	.....	.....	.....	24,197
Adelbert H. Alden, Ltd.....	.....	.....	.....	.....	.....	67,573	12,770	9,380	61,419	151,142	151,142
General Rubber Co. of Brazil.....	272,545	6,678	55,970	42,254	377,447	53,548	6,904	3,033	21,006	84,491	461,938
J. Marques	9,789	6,630	43,527	6,232	66,178	51,950	.....	.....	51,040	102,990	169,168
Suarez, Hermanos & Co., Ltd.....	20,744	382	1,557	944	23,627	148,823	.....	21,462	45,632	215,917	239,544
Fires, Teixeira & Co.....	26,611	2,747	31,761	25,007	86,126	12,070	850	.....	.....	12,920	99,046
Suter & Co.....	13,090	1,190	26,509	518	41,307	14,215	295	148	32,784	47,442	88,749
Stowell Brothers	.....	.....	.....	.....	.....	2,550	340	330	19,426	22,646	22,646
Sundry exporters	6,482	964	11,913	20,700	40,059	14,245	1,807	4,341	18,044	38,437	78,496
Itacoatiara direct	.....	.....	.....	.....	.....	5,676	490	4,402	3,730	14,298	14,298
	362,523	18,591	171,726	106,101	658,941	370,650	23,456	43,096	253,081	690,283	1,349,224
Manáos	83,597	25,174	171,008	158,648	438,427	278,777	50,678	21,233	173,935	524,623	963,050
Iquitos	91,790	3,709	5,758	87,609	188,866	44,397	7,971	7,741	164,854	224,963	413,829
Total	537,910	47,474	348,492	352,358	1,286,234	693,824	82,105	72,070	591,870	1,439,869	2,726,103

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IMPROVED HOSE REEL.

A new hose reel is constructed so that by moving the reel truck on the ground a friction transmission causes the reel to wind or unwind the hose. A simple clutch arrangement neutralizes the friction gearing at will. [German Empire Registered Sample No. 627,866.]

THE RUBBER SCRAP MARKET.

THE Russian embargo on the exportation of rubber scrap has closed for the time being the source of large supplies that were imported to the United States previous to the war. However, it is announced that arrangements are being made by the Department of Commerce of the United States and the Russian foreign office, by which goods will be exported from Russia under a guarantee that they will not be re-exported. If this arrangement is consummated, it will release considerable rubber scrap that is now withheld from the American market. The imports of rubber scrap into the United States from Russia during the year 1912-1913 were 7,468,274 pounds, valued at $619,594. In the year 1913-1914 there was imported 5,018,555 pounds, valued at $453,522. The Italian government has now placed waste and reclaimed rubber on the list of goods considered absolute contraband.

During the month of July there was very little business being done in a public way, but the firm tone of the market and steady prices seemed to indicate that considerable business was being transacted quietly. As a rule, the mills are quite busy in July, and as the manufacturers have been working overtime on war orders, the indications are that the waste trade will soon feel the effects of this general trade movement.

Early in the month, boots and shoes were held at 7⅝c. delivered to the mills, although some business was reported at a shade less. The price of Goodrich and Goodyear auto tires was firm at 6⅝c. delivered; and No. 1 inner tubes continued strong at 25½@26c. As the month progressed there was very little trading, and it is evident that large quantities of scrap have been quietly absorbed by the mills from various sources, which is now being used.

During the last week of the month the purchasing trade appeared reluctant to enter the market with large orders, but the impression exists that next month will record better business.

The rubber scrap imports for eleven months ending May, 1915, were: 9,833,120 pounds, valued at $652,019, against 23,361,452 pounds, valued at $1,889,125, for the same period in 1914. Exports for the same period in 1915 were 2,056,564 pounds, valued at $241,781, against 5,610,213 pounds, valued at $532,945, for 1914.

Rubber scrap imports received at the port of New York during July were as follows: July 6, by the "Havana," from Havana, 50 packages; July 8, by the "Athinai," from Piraeus, 1 barrel; July 9, by the "Tropea," from London, 35 barrels; July 13, by the "Parima," from St. Croix, 1 box; July 13, by the "Saratoga," from Havana, 29 packages; July 13, by the "Kentigern," from London, 25 barrels.

PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.
New York, July 30, 1915.

	Per Pound.
Boots and shoes ... *cents*	7¾@
White Goodrich and Goodyear tires ...	7 @
Morgan & Wright and U. S. tires ...	6¼@ 6½
Trimmed arctics ...	6 @ 6¼
Auto tires, mixed ...	5 @ 5⅛
Solid tires ...	4⅜@
No. 1 inner tubes ...	25 @26
No. 2 inner tubes ...	11½@
Red tubes ...	10¾@
Bicycle tires ...	3 @ 3⅛
Irony tires ...	1¼@ 2¼
No. 1 auto peelings ...	8 @ 8½
Mixed auto peelings ...	6¾@ 7
No. 1 soft white rubber ...	11 @12
White wringer rubber ...	9¼@ 9½
No. 1 red scrap ...	10 @10¼
Mixed red scrap ...	7¼@ 7½
Mixed black scrap ...	2½@ 2¾
Rubber car springs ...	3¼@
Horse shoe pads ...	3 @ 3¼
Matting and packing ...	½@ ¾
Garden hose ...	¾@ ⅞
Air brake hose ...	5 @
Cotton fire hose ...	1¼@ 2

Rubber, iron, copper, etc., No. 2,509.—Sealed proposals will be received at the office of the Lighthouse Inspector, Y. M. C. A. Building, Portland, Me., until August 16, 1915, for purchase of old materials, such as bell metal, rubber, iron, copper, yellow metal, rope, boats, etc. Blank proposals and particulars may be had by addressing above office.